INDEX TO SPECIFICATIONS

END OF INDEX

01 00 00 - GENERAL REQUIREMENTS

LINES & LEVELS: Before starting Work, locate all general reference points. Take such steps as are necessary to prevent their dislocation or destruction. If disturbed or destroyed, replace as directed.

ARCHITECTURAL MANUAL: At the end of the project, along with Mechanical & Electrical Manuals, the General Contractor will provide (1) bound copy of all shop drawings, installation manuals and maintenance instructions for all other specification divisions.

ELECTRONIC MANUAL: In lieu of paper copies, an electronic PDF project manual that includes all shop drawings, installation manuals and maintenance instructions for all specification divisions may be provided on a CD at the end of the project and prior to final payment.

TESTS: The Owner will pay for tests and inspections they feel necessary for quality assurance, other than those normally required by Public Authorities or unless otherwise specified. The Contractor shall, at his expense, furnish samples for all tests and deliver them to the Testing Agency when and where directed by the Architect. Contractor will pay costs of failed tests. Contractor remains responsible for tests and inspections they feel necessary to provide quality control of their Work.

LAYOUT CONTROL: Layout will be the Superintendent's responsibility. The Benchmark given on the Site Plan will be the vertical elevation that all other elevations are set in relation to. Do not use other control points for establishing elevation unless they are set on site using conventional methods.

SPECIAL INSPECTIONS: General Contractor shall notify the Architect 48 hours prior to operations requiring inspection by IBC Sec. 1704. Inspections are required, but not limited to, on the following:

Concrete: Placing and test sampling
Reinforcing Steel: Placement
Welding: Structural and re-bar
High-Strength Bolting: Installation
Structural Masonry: Reinforcement, placing, grouting
Piling, Piers & Caissons: Driving & Testing
Special Earthwork: Engineered Fill

TEMPORARY FACILITIES: By General Contractor (unless noted otherwise)

A. Water: Mechanical Contractor to lay the permanent water service to the building site, provide a temporary hydrant and pay all costs.

B. Temporary Power: Electrical Contractor to furnish temporary meter, disconnect, and 4-way GFCI outlet on pole in a location indicated by the General Contractor. When able to use permanent panels and outlets inside, provide temporary power inside building at convenient locations. Each trade will be responsible for own temporary lighting. Make arrangements for temporary electric service and pay expenses thereof. General Contractor to pay for all power consumed.

C. Toilet: Provide and maintain sanitary temporary exterior toilet where directed, ultimate removal as directed. Set a temporary water closet within the building when possible, to be replaced with permanent fixture when directed.

D. Field Office: Provide substantial weathertight office building on premises where directed. Remove building from site on completion of Contract, or sooner if directed. Field office building may be a trailer.

E. Telephone: Contractor shall install a job telephone at his expense. Phone may be a cell phone, but either way there must be a means of contacting someone on-site during construction hours.

F. Cold Weather Protection: Heating required before the building is enclosed shall be furnished by each Contractor or Sub-Contractor requiring same with heating units of approved types. Equipment and surroundings kept in clean and safe condition.

G. Temporary Heat: Heating required after the building is enclosed and until the Certificate of Substantial Completion is signed. The building is considered enclosed when it is roofed and has protection at openings which will provide reasonable heat retention. Furnish all fuel and power for heating during "Temporary Heat" period; furnish labor and supervision as necessary and be responsible for its operation. Maintain 50 degrees F. minimum and 75 degrees F. maximum during the working hours. At all other times the temperature in all parts of the building shall be kept above freezing or as required for certain materials. Once the building is enclosed use only vented heating devices, open salamanders or similar moisture producing devices are not permitted. Use of the permanent heating system is strictly prohibited until the taping portion of the work, or any other dust producing activity, is completed. Refer to Mechanical specifications for other limitations on use of equipment. Thoroughly clean all heating equipment, fans, ductwork, coils, etc. and replace all filters before final acceptance.

H. Temporary Stairs, Ladders, Ramps, Runways and Scaffolding: Furnish and maintain, as required by all trades. Assess others on basis of use. Such apparatus, equipment and construction to meet requirements of labor laws OSHA and other State or Local laws.

I. Temporary Fire Protection: Contractor shall provide and maintain fire extinguishers, fire hoses and other equipment necessary for fire protection during construction.

J. Protection of Work-In-Place: Work-in-place that is subject to injury because of operations, weather, heat, cold, wind, etc. shall be covered, boarded-up or substantially enclosed with adequate protection.

CLEANING: Upon completion, the Contractor shall leave building in clean condition including floors, walls & glass. Exposed concrete floors shall be smooth & free of paint, stains or dirt.

RECORD DRAWINGS: The General Contractor will keep one set of drawings on the site to be used exclusively for recording ANY changes made to the original drawings by all trades. These changes will be made in red pencil or ink and recorded at the time the changes are made by the trade making the change. This set of drawings will be delivered to the Architect at completion of the project and before final payment is made.

GUARANTEES AND WARRANTIES: Perform all work required under guarantees and warranties for one (1) year following completion date. Throughout the Specifications, certain work or materials will have longer warranty or guarantee periods; provide written warranties or guarantees on these items before final payment.

PROJECT MEETINGS:

Pre-Construction Conference: The Architect will schedule and conduct a pre-construction meeting at the Project Site or other convenient location. Authorized representatives of the Owner, Architect, and their consultants; the Contractor and his superintendent; major subcontractors and suppliers; and other concerned parties shall attend. Participants shall be familiar with the Project and authorized to conclude matters relating to the Work.

Pre-installation Conferences: The Contractor shall conduct pre-installation conferences at the Project Site prior to each construction activity that requires coordination with other trades. Subcontractors, manufacturer representatives and fabricators involved or affected by the particular work shall attend the meeting. Notify the Architect of scheduled meetings.

Monthly Progress Meetings: The Architect will schedule and conduct monthly progress meetings. The Contractor, his Superintendent, subcontractors, suppliers or other entities concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. Meeting will review and correct or approve minutes of the previous meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

END OF DIVISION

01 10 00 - ALTERNATES

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed apply to this Section.

ALTERNATE PRICES: Contractor shall state, in the spaces provided in the Form of Proposal, Alternate Prices for the Work described below. The responsibility of determining quantity of Alternates rests with the Contractor. Base Bid and Alternate shall include cost of all supporting elements required so that no matter what combination of Base Bid and Alternates are accepted that portion shall be a complete entity in itself. Work for all Alternates shall be in strict accordance with the Specification Sections noted and applicable to the specific Work.

ALTERNATE A-1: Additional Cost to add (4) Solatubes Skylights as shown in the drawings and described in the specifications.

ALTERNATE A-2: Additional Cost to add 45'-0" x 24'-0" Concrete Apron Extension as shown in the drawings.

END OF SECTION

DIVISION 2 – EXISTING CONDITIONS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply.

AS-BUILT DRAWINGS: Per SPECIAL CONDITIONS.

SCOPE: Complete all Site Drainage and Utility Work as shown on the Drawings and as specified.

CONDITIONS AT SITE: Visit the site. Examine and note all conditions as to the character and extent of Work involved. Protect any adjacent property and improvements from damage and replace any portions damaged through this operation. Maintain all bench marks, control monuments, and stakes, whether newly established by Surveyor or previously existing. Protect from damage and dislocation. If necessary to disturb existing bench marks, re-establish in a safe place.

PERMITS & ORDINANCES: Procure and pay for all necessary permits or certificates required by local authorities having jurisdiction over the Work. Comply with all Federal, State and Local Laws.

COORDINATION: Cooperate and coordinate the Work with the various Sub-contractors whose work might be affected by operations.

ADJACENT PROPERTY: Restore any damage to adjacent properties, streets, and the like caused by operations of this Division to original condition without additional cost to the Owner.

TESTS: The Foundation Engineer who prepared the Soils Report (if applicable) shall perform all tests and inspections required by this Division. Relative compactions shall be determined as specified in ASTM D-698. Owner will pay for all passing tests; Contractor will pay for all failed tests.

EXISTING UTILITIES: Where existing utilities not shown on the Drawings are encountered: support, shore up, protect same and immediately notify Architect. Allow entrance, opportunity, and ample time for measures necessary for continuance and/or relocation of such services.
Where noted on Drawings, cut and cap all street connections encountered in the excavating along curb line and mark location so they can subsequently be located and re-connected as required.

LAYOUT: Layout and Work under this Division shall be made by competent personnel experienced in surveying. If any discrepancies are found by Contractor between the Drawings and actual conditions at the site, Architect reserves right to make such minor adjustments in Work specified as necessary to accomplish the intent of the Contract Documents without increased cost to the Owner.

CLEAN-UP: Remove from the Site all rubbish, debris, etc. resulting from Work in this Division, except as otherwise specified above, per SUPPLEMENTARY GENERAL CONDITIONS.

WORK IN OTHER DIVISIONS:

A. Concrete – Division 3
B. Earthwork – Division 31
C. Exterior Improvements – Division 32

END OF DIVISION

DIVISION 3 - CONCRETE

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Division.

SCOPE: Supply/install all Concrete work as shown on the Drawings and as specified herein.

SHOP DRAWINGS: Per SUPPLEMENTARY GENERAL CONDITIONS, submit Shop Drawings showing bending and placing of all imbedded items. Drawings shall include diagrammatic elevations of all walls at a scale sufficiently large to show clearly the position and erection marks of marginal bars and their dowels and splices.

REFERENCE STANDARDS: Comply with all applicable Federal, State and Local codes, safety regulations, Portland Cement Assoc. Standards, "Manual of Standard Practice for Detailing Reinforced Concrete Structures", American Welding Society, Vermiculite Institute Specifications, and any others referred to herein.

COORDINATION:

A. Obtain information and instructions from other Trades and suppliers in ample time to schedule and coordinate the installation of items furnished by them to be embedded in concrete so provision for their work can be made without delaying the Project.
B. Do any cutting and patching made necessary by failure or delay in complying with these requirements, at no cost to Owner.

TESTS AND INSPECTIONS:

A. The Owner shall pay costs of laboratory tests/inspections directly to the Testing Agency.
B. The Contractor shall:
    1. Take three (3) identical test cylinders as directed by the Architect. Make test cylinders and store properly before delivering to Testing Agency.
    2. Be responsible and pay for delivery of all required concrete specimens to the Testing Agency at the proper time.
C. Inspection of Reinforcing Steel and Concrete Placing: Before any concrete is poured on any particular portion of Project, reinforcing steel will be checked and approved by Architect. Correct any errors or discrepancies before concrete is placed. Such checking and approval shall not relieve Contractor from his responsibility to comply with the Contract requirements.

GENERAL:

A. Produce concrete of required consistency and strength to present appearance satisfactory to the Architect.
B. Use only one brand of cement unless otherwise authorized by Architect.
C. Place all pipe sleeves, anchors and bolts, angle frames, inserts, supports, ties and other materials in connection with concrete construction and secure in position before concrete is placed.
D. Store materials delivered to the job and protect from foreign matter and exposure to any element which would reduce the properties of the material.
E. Pour no concrete unless air temperature is a least 40 degrees F. and rising. When temperature cannot be expected to remain above 40 degrees F. for at least three days, protect from freezing by covering with insulating materials, providing heating devices or other suitable means subject to approval by Architect. Temperature of concrete at time of pouring shall not be less than 50 degrees F. not more than 75 degrees F.

CONSTRUCTION JOINTS: Location and details of construction joints shall be as indicated on Drawings, specified, or as approved by Architect. Locate so as not to impair the strength of the structure. Submit Drawings with construction joints clearly defined, and schedule of pouring operations for approval before starting concreting.

CONTROL JOINTS: Provide as indicated on Drawings.

PATCHING AND CLEANING:

A. After forms are removed, remove projecting fins, bolts, form ties, nails, etc. not necessary for the Work or cut back one inch from the surface. Joint marks and fins in exposed Work shall be smoothed off and cleaned.
B. Repair defects in concrete work. Chip voids and stone pockets to a depth of one inch or more as required to remove all loose material. Voids, surface irregularities, chipped areas, etc., shall be filled by patching, gunnite or rubbing, as directed by Architect. Repaired surfaces shall duplicate appearance of un-patched work.
C. Clean exposed concrete surfaces and adjoining work stained by leakage of concrete.

CLEAN-UP: In addition to the requirements of SUPPLEMENTARY GENERAL CONDITIONS, clean-up all concrete and cement work on completion of this project of the Work, except protective coatings or building papers shall remain until floors have completely cured or until interior partitions are to be installed.

WORK IN OTHER DIVISIONS:

A. Existing Conditions – Division 2
B. Earthwork – Division 31
C. Exterior Improvements – Division 32

END OF DIVISION

03 11 00 – CONCRETE FORMING

GENERAL REQUIREMENTS: Per DIVISION 3 - CONCRETE

GENERAL:

A. Provide complete forms of such strength and construction as to prevent any spread, shifting, or settling when concrete is deposited, and tight enough to avoid any leakage or washing out of cement mortar.
B. Remove all dirt, chips, sawdust, rubbish, water, etc., from forms by water hosing and air pressure before any concrete is deposited. Leave no wooden ties or blocking in concrete except where indicated for attachment of other work. Leave lowest board of forms along walls loose or provide clean-out pockets. At any columns and pilasters, provide holes in forms at bottom for cleaning purposes. Leave openings and holes open until just before concrete is poured.
C. Provide openings for the introduction of vibrators wherever necessary. Where required on account of excessive drop, or required by Architect, provide elephant trunks or side openings to receive concrete.
D. Architect will cooperate with Contractor in the matter of removing forms and shoring as early as possible. The length of time forms must remain in place depends on the rate of time required for concrete to obtain a proper strength and on construction loads that will be placed on concrete.
E. On removal of forms, all bolts, wires for anchoring, etc., shall be either removed, cut off to lengths as directed or left in place for anchorage of other work as specified.
F. Forms to be reused shall be in good condition and thoroughly cleaned before being reused.
G. Provide 3/4 inch chamfer at any wall, column and vertical corners unless otherwise shown.

MATERIALS:

Slabs, Walls and Exposed Concrete: Forms for flat exposed surfaces shall be 5-ply Exterior B-B (Concrete Form) panels. See requirements for thickness hereinafter. Panels with raised or separate face veneers shall not be used for exposed concrete.

Other Forms: Except where otherwise specified, shown or noted, forms for other concrete surfaces shall be constructed of Douglas Fir, smooth surfaced on the contact side, culled for loose knots and/or undesirable defects. Form Ties and Spreaders shall be metal, flat bar or cone nut type. No wood spreaders will be permitted. "Nominal" length ties NOT ACCEPTED: 8" walls are to be full 8" thick.

Optional Forming Systems: Pre-engineered steel, aluminum or composite form systems in good condition may be used in lieu of forming specified above. Form Sealer shall be PROTEX Procoat" or equal.

Rough Hardware: Nails, bolts, screws, anchors, etc., as shown or needed shall be furnished and set.

END OF SECTION

03 20 00 - CONCRETE REINFORCING

GENERAL REQUIREMENTS: Per DIVISION 3 - CONCRETE

REINFORCEMENT:

A. Reinforcing Bars shall be deformed bars conforming to ASTM A615 Grade 40. Use ASTM Grade 60 for #4 and larger bars.
B. Welded wire fabric shall conform to requirements of ASTM A185 using bright steel wire meeting ASTM A82. Gauges and dimensions shall be as noted on the Drawings.
C. All steel for reinforcement shall be new, unrusted stock, free from mill scale and delivered without rust other than may have accumulated in prompt transportation to the Work. Chairs shall be standard Class B chairs as specified in the "Manual of Standard Practice", the Concrete Reinforcing Steel Institute and Western Concrete Reinforcing Steel Institute. Tie wire shall be No. 16 American Wire Gauge or heavier, black annealed.

Reinforcing Steel: All bars, except No. 2 size (1/4 inch) shall be deformed as per ASTM A 305, Intermediate Grade, except to meet bend and elongation tests for Structural Grade. ASTM A 15, Hard Grade, weldable quality. ASTM A 408, large size deformed bars, weldable quality. ASTM A 432, high strength column bars, weldable quality. Supports for reinforcing bars in slabs shall be metal, of sufficient strength to adequately support the bars, and shall be of a type approved by the Architect. Supports or spacers for bars in walls shall be such that exterior face of wall will not be marred when forms are stripped and final finish has been completed. Dowels from footings to walls shall be same size and spacing as wall reinforcement, unless otherwise shown, and shall project thirty (30) diameters into wall and thirty (30) diameters into footing unless detailed or noted otherwise.

PLACING REINFORCING STEEL:

A. Reinforcement shall be accurately placed and securely tied at intersections with 16 gauge black annealed wire. It shall be maintained in proper position by chairs, bar supports, or other approved devices.
B. Bars shall lap 30 diameters and splices, except as other indicated. Splices in adjoining horizontal bars shall be staggered at least 6 ft. Where this is not feasible, submit suggestions for the Architect's consideration. Horizontal bars shall be hooked around corners not less than 24 diameters, with a minimum of 12 inches as per typical details.
C. Concrete protection of reinforcing shall be not less than the following:
    1. 3 inches where concrete is poured against ground.
    2. 2 inches where concrete is poured against forms but may be in contact with ground.
    3. 1 1/2 inches minimum in exterior face of exterior walls (exposed to weather but not in contact with ground).
    4. 3/4 inch minimum in interior walls and interior face of exterior walls.
    5. 1 1/2 inches in beams, girders and columns.

END OF SECTION

03 30 00 - CAST-IN-PLACE CONCRETE

GENERAL REQUIREMENTS: Per DIVISION 3 - CONCRETE

DESIGNING AND PROPORTIONING:

A. The concrete shall: have the lowest slump compatible with placement requirements. Work readily into corners and angles of forms and reinforcement without excessive vibration and without permitting materials to segregate or free water to collect on surface.
B. In general, improve workability by adjusting grading rather than by adding water.
C. Provide a ticket for every load of concrete. Contractor is to maintain a file on all load tickets and provide a copy of all tickets to the Architect.

MIXING:

A. Use ready-mixed concrete complying with ASTM C94 and with the requirements of Contract Documents. Mix for a period of not less than ten (10) minutes; at least three (3) minutes of mixing period shall be immediately prior to discharging of the job.
B. Introduction of additional water after initial mixing not permitted unless water to cement ratio remains below 0.50.
C. Temperature of concrete at time of placing shall not exceed 75 degrees F.

WEATHER REQUIREMENTS: Do not mix or place when atmospheric temperature is below 40 degrees F. or when conditions indicate temperature will fall below 40 degrees F. within 72 hours. Concrete deposited shall have temperature not less than 60 degrees F. Reinforcement, forms and ground which concrete will contact shall be completely free of frost. Keep concrete and formwork at a temperature not less than 50 degrees F for not less than 72 hours after pouring. During below freezing temperatures allow concrete to gradually cool for 48 hours after the 72 hour period.

CONVEYING AND PLACING:

A. Notify Architect at least 24 hours before placing any concrete.
B. Carry on concreting once started, as a continuous operation until the section of approved size & shape is completed. Make pour cut-off's of approved detail & location.
C. Handle concrete as rapidly as practicable from mixer to place of deposit by methods which prevent separation or loss of ingredients. Deposit as nearly as practicable in final position to avoid rehandling or flowing. Do not drop concrete freely where reinforcing bars will cause segregation, nor drop freely more than six feet. Deposit to maintain a plastic surface approximately horizontal. In walls, deposit in horizontal layers not over eighteen inches deep. In pouring columns, walls, or thin sections of considerable heights, use openings in forms, elephant trunks, tremies, or other approved devices which permit concrete to be placed without segregation or accumulation of hardened concrete on forms or metal reinforcement above the level of the concrete. Install so concrete will be dropped vertically. At least two hours shall elapse after depositing concrete in walls or columns before depositing in heads over openings, supported beams, girders, or slabs.
D. Concrete that has partially hardened shall not be deposited in the Work.
E. Compact thoroughly using approved mechanical vibrators. Provide pour holes in forms to the extent necessary to insure filling or to allow necessary inspection. When starting a new pour or where conditions make puddling difficult, or where reinforcing is congested, place modified concrete with the same sand-cement proportions as elsewhere, but with not more than one-half the normal amount of course aggregate per yard. Use modified

concrete to depth of not less than three inches when starting a new pour.

F. Use mechanical vibrator at each point of dump, and a stand-by vibrator in good working order, but not in use, shall be kept on the job until all concrete is placed.

PROTECTION AND CURING:

A. Keep forms sufficiently wet to prevent drying out of concrete for at least seven days after concrete is deposited.
B. Immediately after finishing slabs, cure with 2 mil poly sheet after misting slab. Leave sheet on as long as practical, but in no event less than 72 hours.

MATERIALS:

3000 to 4000 psi 5 SACK GUIDELINE MIX DESIGN: This is a preferred mix guideline and will vary, depending on locally available material. In any event a minimum 58% aggregate is required.

PRODUCT	WEIGHT (lbs)
Type I-II Cement	480
Concrete Sand (ASTM C-33) (40%)	1300
1 1/2" Minus Washed Rock	1950
Water (Water/Cement Ratio = 0.45) lbs/gal	216 / 26
Plasticizer (X oz. per 100# cement)	XX oz.
Air (0% Interior/5% Exterior)	2% / 5%

Portland Cement: Type II or Type III as specified shall conform to "Standard Specifications for Portland Cement" (ASTM C-150). One brand of cement shall be used throughout the Work for structural purposes. Cement shall have been used for at least two years with the proposed aggregate without detrimental reaction. Contractor is required to obtain from the cement manufacturer and to furnish the Architect with satisfactory evidence of the kind and quality of all cement to be supplied.

Aggregates: Shall conform to "Standard Specifications for Concrete Aggregates" (ASTM C-33), except as modified herein. "Gap-grading" of aggregates strictly prohibited. Provide even grading of all sizes of aggregate.

Water: Potable.

Air Entraining: Air entraining - ASTM C-260. MASTER-BUILDERS "Micro-Air" or equal. Use in all exterior concrete (and only as approved by Architect - permissible tolerance +/- 1%). Note: For concrete in transit more than 30 min. consult Architect about increased air entertainment.

Reinforcing Fibers: **Fibermesh 300** polypropylene, collated, fibrillated fibers added to concrete mix at the rate of 1.5 lb./cy.

Water Reducer: Equal to **Euclid *Eucon WR 91*** non-corrosive admixture. Added to load per manufacturer's directions**.**

Plasticizer: Contractor's option – with approval by Structural Engineer or Architect.

Accelerator: Added at the batch plant and only with Architect's approval, MASTER-BUILDERS "Pozzutec 20" non-chloride.

Form Release: DAYTON SUPERIOR Q-2 VOC (or Q-2 WINTER GRADE when applicable) or equal to provide required separation and leave surface area with substantially the same appearance of untreated concrete.

Curing: 2 mil poly sheet applied with water after finishing so it adheres to the slab. Leave in place 3 to 7 days.

Harden & Sealer: **Dayton-Superior *J-17*** or equal siliconate seal, hardener and dustproofing compound on interior concrete floors not receiving finish flooring.

Evaporation Retarder: **Sika *SikaFilm*** finishing aid or equal.

Ext. Concrete Cure: Equal to **C2 Products, Inc. *THE BEAN*** 27% soybean oil emulsion applied immediately after finish at rate of 200 square feet per gallon.
Ext. Concrete Sealant: **Dayton-Superior *J-33*** or equal linseed oil base. (Can be used as cure)
Screed Rails: Equal to **MASCO *Combiform,*** size as recommended by manufacturer for slab thickness. Set level and secure in place using Groundplate and adjusting screws and locking clips to set width and fine tune height. Place as indicated on plans for interior flatwork, generally on grid lines between bearing locations and off of corners.

STRENGTHS, SLUMPS, CEMENT CONTENT:

A. Use	28 Day Strength	Max. Slump	Min. Cement/CY
Footings & Foundations	3,000 psi	4"	5.5 Sack
Exterior Flatwork	4,000 psi	4"	6.0 Sack Fibermesh
Interior Flatwork	3,000 psi	4"	5.5 Sack

B. Water Content: The materials shall be mixed with a minimum amount of water to produce a concrete of such consistency as will allow it to flow sluggishly into forms, around reinforcing steel and completely fill forms with the aid of thorough vibrating and tamping. The water/cement ratio shall not exceed 0.450. Slumps shall not, under any conditions, exceed those given except where water reducer is used, in which case slumps may be double that shown.
C. Curing: Cure all flatwork with 2 mil sheet poly, misting the slab to get the poly to adhere to the surface. Leave sheet in place seven days. Use of curing compounds prohibited.

INTERIOR FLOOR SLAB FINISHES: Finish monolithic with structural slab. Slab concrete shall be reinforced or wire-mesh reinforced as noted on the Drawings and placed with minimum practicable slump not to exceed four inches. The freshly placed slab shall be compacted and screeded uniformly to grades shown. Push large aggregates below surface with a screen tamper, screed and bull float. As soon as surface becomes workable, it shall be wood floated, then steel troweled to a uniform smooth, true surface finish in a neat and workmanlike manner. Surface of finish slabs shall not vary more than 1/4 inch in any ten foot direction. Where floor drains are located in level floors locate drain minimum 1" below finish floor (unless noted otherwise) and slope to drain with 48" diameter sloped area around drain. Floor drains that do not drain will have floor and drain replaced so they do drain properly at no expense to the Owner.

SIDEWALKS AND EXTERIOR SLABS: ALL Sidewalks and slabs shall be 1.5# **Fibermesh** reinforced concrete finished monolithic with the structural slab as specified above for interior slabs. After trowelling exterior slabs shall receive a broom finish and be scored with lines, as shown on Drawings. Scored lines will be formed by tooling with a concrete groover, NOT saw cutting, and shall be approximately one third the slab thickness in depth, or 1 1/4" for a 3 1/2" thick slab, and shall be at least 1/8" wide, but no more than 1/4" wide. Exterior slabs shall be formed with slopes as indicated, as directed or as necessary to insure proper drainage. Exterior slabs adjacent to building shall drain away from building. Seal all exterior concrete with specified sealant after 28 days cure.

FINISHER CERTIFICATION: All Flatwork will be finished by experienced craftsmen certified as ***ACI Concrete Flatwork Finisher***. When requested, provide copies of certificates for finishers who are not listed on the ACI website as certified.

END OF SECTION

DIVISION 5 - METALS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Division.

SCOPE: Supply and install handrail as shown on Drawings and as specified herein including all anchorage devices and required appurtenances.

SHOP DRAWINGS: Per SUPPLEMENTARY GENERAL CONDITIONS, submit Shop Drawings of all Work herein showing layouts, sizes, methods of construction and installation, including sizes and types of all fastening devices.

GUARANTEE: Per GENERAL CONDITIONS.

MEASUREMENTS: Verify all dimensions by taking field measurements; proper fit and attachment of all items is required.

COORDINATION: Coordinate with other trades for prompt delivery of all materials needed for erection or installation. Identify all bolts or other loose materials.

DELIVERY AND STORAGE: Deliver and store materials in dry protected areas. Protect from rusting and other damage. Remove any damaged items from site and replace at no cost to Owner.

REFERENCE STANDARDS: Except where provisions of these Specifications are more exacting, Work of this Section shall comply with all applicable provisions of the following:

A. Standard Specifications for the Design and Fabrication of Structural Steel for Buildings, of the American Institute of Steel Construction.
B. Code of Standard Practice for Steel Buildings and Bridges, of A.I.S.C. Code for Welding in Building Construction, D1.1 of the American Welding Society.
C. Specifications for Structural Joints using A.S.T.M. A-325 or A-490 Bolts by the Research Council on Riveted and Bolted Structural Joints.
D. A.I.S.C. "Manual of Steel Construction".
E. "Standard Specifications for Open Web Steel Joints" adopted by the Steel Joint Institute and A.W.S.

FABRICATION:

A. Standard commercial products conforming to requirements of Drawings and Specifications may be used subject to approval of Architect. Bolt with proper size bolts. Nuts shall be drawn tight and end threads upset. Screws and bolts shall be standard and washers provided where necessary.
B. Build anchors and other connecting members required to concrete into concrete as Work progresses to avoid unnecessary cutting and drilling.
C. Execute all Work using skilled metal workers only. Use only certified welders. Do only such work at the site as cannot reasonably be performed in the shop. Make cuts, bends, punching and drilling accurate, neat and properly located. Grind and file smooth all parts exposed to view; leave exposed surfaces free of fabrication marks. Make members true to length to allow assembly without fillers.
D. Do all welding per A.W.S. specifications. Apply "Galvaweld" or equal to any surfaces welded after galvanizing.
E. Make fabrication of all structural steel shapes conform to A.I.S.C. Standards.

F. Furnish all necessary templates and patterns required by other trades and any items built into Work under other Sections. Supervise and be responsible for proper location and installation of built-in items. Deliver items required to be embedded in concrete or built into partitions and other locations to respective Contractors. Provide holes and connections for work of other trades and make necessary connections.
G. When possible, fit and shop assemble, ready for erection. Shop and field connections: riveted, welded or attached with screws, countersunk and finished flush where exposed.
H. Provide positive insulation of metals from contact with masonry and different metals from contact with each other where necessary to prevent corrosion.

ERECTION: Install material under experienced supervision and in strict accordance with manufacturer's erection details and instructions.

A. Protect all supports, fastenings and backs of panels against corrosion and effects of moisture. All supports and fastenings shall meet building code requirements.
B. Accurately place and align units with all joints plumb, level and true.
C. Attach and positively fasten but allow for expansion and contraction. Conceal all fastenings except where specifically indicated otherwise.

CLEANING AND PROTECTION: Clean all pre-finished metal for inspection. Protect Work at all times from stains, scratches or any other damage until completion of project.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS.

END OF DIVISION

05 50 00 – METAL FABRICATIONS

GENERAL REQUIREMENTS: Per DIVISION 5 - METALS.

SHOP PRIMING:

A. Shop coat with primer.
B. Clean iron and metal to be primed of scale, dirt and rust by steel scrapers, wire brushes or sandblasting. Remove oil and grease with petroleum naphtha.
C. Thoroughly work paint into all joints by brush. Overall application of brush or spray coat of red PPG 6-712 inhibitive primer.
D. Give any painted built-in portions one field coat of primer on all abraded parts after installation.

MATERIALS:
Aluminum Pipe: 6061-T6 Schedule 40 unless noted otherwise.
Steel: All miscellaneous steel sections shall be standard, cold-rolled sections conforming to ASTM A36 or ASTM A7. Fabricated items requiring welding shall in all cases be made from ASTM A36 steel.
Mild Steel: ASTM A-283.
Galvanized Steel Sheets: Federal Specification QQ-I-716.
Steel Pipe: ASTM A-53; Standard I.P.S. unless shown otherwise, Grade B.
Stainless Steel (exposed): Type 304, 18-8 grade, USS Gauge, finish as shown on Finish Sched.
Cast-Iron Shapes and Castings: ASTM A-43.
Zinc for Galvanizing: ASTM B-6.
Galvanizing Repair: **ZRC** Galvilite containing 95% metallic zinc. Apply two coats with brush as recommended by manufacturer.
Primer: **PPG** 6-712 red, rust inhibitive primer or equal.

ITEMS:
Work required under this Section that is not described in detail below shall be constructed in accordance with the detailed Drawings and/or approved Shop Drawings.

Hoist Beam: 24' length of W6x9 steel beam pre-punched for ½" square U-bolts as indicated on the drawings.

HSS Tubing: 24'-6" length of 2x2x1/4" HSS Tube as indicated on the drawings.

Door Guards: 6" SCH40 Pipe, new or used in good condition.

END OF SECTION

DIVISION 6 – WOOD, PLASTICS, AND COMPOSITIES

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Division.

SCOPE: Supply and install complete wood and plastics work as shown on Drawings and as specified

SHOP DRAWINGS: Per SUPPLEMENTARY GENERAL CONDITIONS. Submit shop drawings of all fabricated work at full size or large scale showing sizes, materials, grain run, methods of construction, connection to adjacent members and installation. Indicate all backing members for installation and all hardware.

SAMPLES: Submit per SUPPLEMENTARY GENERAL CONDITIONS, before fabrication, two (2) completely finished samples of all exposed work specified herein. Wherever possible, samples shall be 12 inches by 24 inches in size.

GUARANTEE: Per GENERAL CONDITIONS.

MEASUREMENTS: Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

COORDINATION: Coordinate with all other trades as required to complete Work to satisfaction of Architect.

DELIVERY AND STORAGE: Deliver and store all materials under protective cover and store within dry enclosed area.

STANDARDS: Following standards apply to Work of the Division except where more stringent requirements are specified herein:

A. Architectural Woodwork Institute "Quality Standards"
B. Western Wood Products Association Manual
C. American Wood Preservers Association Specifications
D. National Forest Products Association
E. West Coast Lumber Inspection Bureau
F. Douglas Fir Plywood Association
G. California Redwood Association

WOOD BACKING: Provide all wood backing, furring, stripping or blocking indicated or required for installation and attachment of work of all other trades. Cut and frame all openings required by other trades. Structural members shall not be cut, notched, or drilled except as shown or noted on Drawings.

TERMITE CONTROL AND DECAY PREVENTION: Remove all wood, including form lumber, scrap lumber, shavings and sawdust in contact with ground. Leave no wood buried in any fill or backfill.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS.

END OF DIVISION

06 10 00 - ROUGH CARPENTRY

GENERAL REQUIREMENTS: Per DIVISION 6 – WOOD, PLASTICS & COMPOSITES

CONNECTIONS:

A. Nails: Bright common wire nails, galvanized for exterior work. Subdrill where necessary to avoid splitting.
B. Bolts: Drill bolt holes 1/32 inch larger than bolt diameter. Use square plate or malleable iron washers under heads and nuts where they bear against wood. Re-tighten bolts immediately prior to concealing with finish work. Re-tighten exposed bolts immediately prior to final inspection.
C. Lag Screws and Screws: Subdrill, use square plate or malleable iron washer under lag screw heads when they bear on wood.
D. Fabricated Connections:
   1. Sheet metal galvanized of size and type shown on Drawings.
   2. Structural Steel: ASTM A36. Welding by qualified welders in conformance with AWS.
   3. Stainless Steel or G90 Galvanized coated rated for contact with treated lumber.

LUMBER SPECIES AND MATERIALS:

Framing Lumber: Hem-Fir or SPF graded as per Standard Grading and Dressing Rules of West Coast Lumber Inspection Bureau or Western Wood Products Association and grade marked by either. All sides surfaced. Grades as follows unless noted otherwise on plans:

Use:	
1 inch boards	"Appearance"
2 X studs, sill plates, etc.	#2 & Better Hem-Fir
Other framing lumber, 2" - 4" thick	"Construction" 1000 f
Miscellaneous blocking, bridging, etc.	"Utility"
Roof sheathing	CDX 40/20 Exp. 1, Fir 5-Ply
Wall sheathing	CDX 32/16 Exp. 1, Fir or OSB
Treated Lumber, Sills & Plates	.4 RET treated 2X plates

Treated Lumber, Sills, Plates, Wood Foundations:
Sill plates in contact with concrete must be manufactured from pressure treated lumber.

For Above Ground use/exposure the following minimum retentions are to be used:
0.25 pcf for ACQ, CCA-C & MCQ
0.20 pcf for CBA-A
0.10 pcf for CA-B

Stainless steel or G-90 galvanized fasteners must be used with ACQ treated sill plates. If borate treated sill plates are used, special fasteners are not required.

Pre-engineered Trusses: Roof truss and floor truss systems pre-engineered to meet all loads indicated on drawings and manufactured in strict accordance with ***Truss Plate Institute*** guidelines. Loads indicated are all applied loads. Roof trusses to use 30 psf minimum live load per Montana Rule 24.301.154. Provide Montana engineer stamped drawings as part of final submittal. Submit shop drawings for approval before manufacture and include all necessary bridging and bracing instructions as well as material required to complete instructions.

Truss Identification: Per UBC 25-17 permanently brand or otherwise identify every truss with: Name & Address of truss manufacturer, design load, and design spacing. In addition mark each truss with a code corresponding to codes used in shop drawing framing plan.

Glue-laminated Beams: Supply industrial grade glue-laminated beams in sizes indicated on Drawings. Beams must have minimum Fv=165 psi, Fb=2400 psi, and E=1,800,000 psi.

FRAMING:
General: Install all wood framing making proper provisions for work of other trades. Do all cutting of wood required to accommodate plumbing, heating and ventilating, electrical and other trades. Fit neatly around all exposed items such as outlet boxes, conduit, pipes and ducts.
Plywood Sheathing: Install plywood roof sheathing with long dimension perpendicular to joists. Install wall sheathing with long dimension horizontal. All plywood shall be laid with the "C" or best face on exposed side. **Special note on OSB sheathing: GAP all OSB joints 1/8". Ply-clip unsupported edges at mid-span on roof sheathing.
Sheathing Attachment: 14 ga. zinc-coated staples may be used in lieu of nails. 16 ga. staples not acceptable. Use 2 staples for every nail unless spacing is noted on drawings. Any over-driven nails or staples are NOT ACCEPTABLE: All over-driven fasteners are to have another properly placed fastener placed next to them immediately. Under-driven fasteners are to be hand set flush with sheathing surface. Consistent overdriving of more than 10% of fasteners without properly placed fasteners next to them may result in rejection of entire sheathing installation.
Rough Framing: Fit closely; set accurately to required lines and levels and secure rigidly in place. Set horizontal and inclined members with crown edge up. Do not cut, notch or bore structural members without specific approval. Reinforce cut members, as directed. Bolt, nail and spike thoroughly with not less than sizes and quantities indicated. Structural members shall provide full contact at all bearing surfaces.

A. Studs: Make walls and partitions of nominal 2 X 4 and 2 X 6 studs, 16 inches on center unless otherwise indicated or required to be larger to accommodate mechanical or electrical equipment, piping and fixtures or the fixtures or equipment of any other trade. Unless otherwise indicated, all panels, valve covers, cleanouts, devices, access doors, recessed cabinet boxes, etc. shall be mounted flush with the adjacent wall surface. When any such item is of a depth where it is not practical to use solid studding to the full thickness of the wall, the wall shall be furred. The studs comprising all interior partitions and the wall material affixed to them shall extend from floor to ceiling joist framing except as otherwise indicated. Staggered stud walls shall be constructed where indicated on Drawings.

B. Top Plates in Bearing Partitions shall be doubled and lapped at each intersection with walls or partitions. Stagger joints in upper and lower members of top plate not less than 4 feet.

C. Provide Blocking not less than 2 inches in thickness of same width as studs as follows: Stud partitions or walls more than 8 feet, but not more than 14 feet in height shall have one row of blocking fitted snugly and nailed into mid-height of stud. Walls or partitions over 14 feet in height shall have two or more rows of blocking. Locate rows of blocking so that in no case will the distance between sole or top plates and blocking or between lines of blocking exceed 8 feet.

D. Frame Corners solid where stud walls or partitions meet, or as indicated on Drawings. INSULATE closed corners while framing!

E. Provide Double Joists, headers and side members at all openings larger than 4 feet in dimension.

F. All Joist Framing into headers and all header joists shall be supported on joist hangers.

BUILDING PAPER: Provide ***TYVEK StuccoWrap*** air infiltration barrier of spunbonded polyolefin as manufactured by **Dupont** behind all exterior siding. Lap 2" to weather and 6" side laps, secure with galvanized staples to hold in place without sagging. Use 3M #8087 BUILDERS SEALING TAPE. Tape all seams, and tape nailing flanges of windows to TYVEK. Slit head-laps so TYVEK flashes window nailing flange head before taping. Provide FLEXWRAP flexible flashing on all window sills up sides 6". Silicone caulk door frames tight to TYVEK prior to installing siding. See appendix for installation instructions.

END OF SECTION

06 20 00 - FINISH CARPENTRY

GENERAL REQUIREMENTS: Per DIVISION 6 – WOOD, PLASTICS & COMPOSITES

FINISH CARPENTRY INSTALLATION:

A. Use only hot dip galvanized or aluminum finish or casing nails. Set nails for putty stopping in surfaced members. Hammer marks not acceptable on any exposed finished surface and may be cause for rejection of Work by Architect.
B. Make all end splices exposed in finished members bevel splices and not square butted. Install members in as long lengths as possible.
C. Install Work to details shown, plumb, level and to line and securely anchored. Make scribes where required accurate. Miter corners of trim.
D. Provide and install other miscellaneous millwork items and related Work required to complete Work of this Section.
E. Ease or radius all outside corners of custom millwork wherever someone could become injured by contact with sharp edges.
F. Prepare all woodwork installed hereunder by cleaning and sanding as required to receive finishes specified in SECTION 09 90 00 – Painting & Coating.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS.

WOOD SPECIES AND MATERIALS:

Douglas Fir/Pine: West Coast Lumber Inspection Bureau "Standard Grading and Dressing Rules" and Western Wood Products Association, graded "D Select", flat grain, grade marked by WCLIB or WWPA.

Blocking, Furring, etc.: Standard Grade Western White Pine, Construction Grade Douglas Fir or other equally sound softwood as graded by WCLIB and WWPA.

Fascia & Soffit System: **Rollex *System 3*** .019 aluminum soffits #SYS316CV.
PVC Steel Fascia #SSL6TP. Provide all trim and miscellaneous parts for a complete and finished system. See drawings for soffit layout.

Caulking: See Section 07 90 00-Joint Protection.

END OF SECTION

DIVISION 7 - THERMAL & MOISTURE PROTECTION

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed apply to this Division.

SCOPE: Supply and install all thermal and moisture protection work as shown on Drawings and as specified herein.

STANDARDS: Have all work done by applicators approved by the manufacturer of the materials and installed in strict accordance with manufacturer's directions.

COORDINATION: Work closely with Sheet, Plumbing and Mechanical Contractors and any other adjacent trades. Whenever the watertightness of the roof is dependent on the work of other trades, assume full responsibility for the finished installation of the integrated assembly. Supervise the sheet metal installer's work and all other adjacent trades as necessary to assure satisfactory fabrication and watertight placement.

INSPECTION: Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Architect, any conditions detrimental to Work. Failure to observe this injunction constitutes a waiver to any subsequent claims to the contrary and holds the Contractor responsible for any corrections Architect may require. Commencement of Work will be construed as acceptance of all subsurfaces.

DELIVERY AND STORAGE: Deliver materials to job site in manufacturer's original unopened packaging. Fully protect against wetness or damage while temporarily stored. Materials designated for a specific application shall be the products of one manufacturer.

PREPARATION: Make all subsurfaces free from material projections, dust loose and foreign materials and any other obstructions, presenting a smooth plane, ready for installation.

WEATHER: Conduct no waterproofing operations when water in any form is present on the surface or when materials are damp, wet or likely to be wetted by the elements.

PROTECTION: Take precautions to protect all Work in this Division, both during and after installation, from damage of any kind.

WATERSTOPPING: At the end of each day's work the work performed during that day shall be sealed at the edges and well covered to prevent moisture from getting under the material.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS.

END OF DIVISION

07 21 00 - THERMAL INSULATION

GENERAL REQUIREMENTS: Per DIVISION 7 - THERMAL & MOISTURE PROTECTION.

WORK IN OTHER SECTIONS: See Section 9c-Drywall for sound insulation.

GUARANTEE: Per GENERAL CONDITIONS.

GLASS-FIBER INSULATION: Un-faced or faced glass-fiber batts, per Drawings as manufactured by **Owens Corning** or equal. Thickness and R-value of insulation per Drawings. Carefully install per manufacturer's directions fitting behind all electrical boxes and plumbing piping. Stuff all gaps around framed openings more than 1/4" wide. Acoustic caulk all gaps around framed openings less than 1/4".

INSULATION BOARD: **DOW *Styrofoam SM,* DiversiFoam *CertiFoam 25*** or **UCI *Foamula R-250***. ASTM C578 Type IV Insulation thickness per Drawings. Noted as "***XPS***" on Drawings. Where insulation is under a veneer attach with DEKFAST 14 plastic or metal washered screw system at 16" on edges and 24" in field or the equivalent using wall ties designed to hold insulation in place. **BSI *Type IX*** 2.00 pound density EPS may also be used.

INSULATION BOARD: Foil-faced polyiso urethane insulation boards **DOW *Tuff-R*** or ***Thermax*** in thickness indicated on Drawings. Where insulation board is to be directly covered with another board sheeting (gyp. board, plywood, etc.) attach with roofing nails at 32" on edges and 24" o.c. in field. Where insulation is under a veneer attach with DEKFAST 14 plastic or metal washered screw system at 16" on edges and 24" in field or the equivalent using wall ties designed to hold insulation in place. Achieve no less than 1 1/4 inch penetration into substrate. Unless covered with TYVEK under siding, TAPE all seams and junctions with dissimilar materials with 3M #8086 Builders Sealing Tape. Noted as ***Polyiso*** on drawings.

BLOWING INSULATION: Class A, fiberglass blowing insulation **Owens-Corning** high density ***Standard Blend*** meeting ASTM C 764 and ASTM #E-84, Type I. Maximum Flame Spread 5, maximum Fuel Contributed 0, maximum Smoke Developed 5 and material must be completely non-corrosive. Federal Specification number must appear on all bags being used along with the manufacturer's name and address. Install as a minimum, the settled depth shown on the drawings, regardless of R-value noted, unless more is required by manufacturer to achieve the “winter design” R-value indicated.

EAVES VENTING: Cardboard or foam-board where eaves venting is noted on drawings provide FULL width vents every joist or truss space.

INSULATING SEALANT: High quality commercial polyurethane equal to **Dow *Great Stuff*** foam sealant; minimal expanding. Provide manufacturer information to Architect prior to use. Use in rough openings of all doors, windows, plumbing, mechanical and electrical penetrations through insulated walls, ceilings, attics or foundation walls.

SILL SEALER: **DOW *Styrofoam Sill Seal*** 1/4" WEATHERMATE gasket for use in sealing plates to adjacent surfaces. Use where shown on drawings.

END OF SECTION

07 40 00 – ROOFING AND SIDING PANELS

GENERAL REQUIREMENTS: Per DIVISION 7 - THERMAL & MOISTURE PROTECTION.

SCOPE OF WORK: Furnish and install the retrofit metal wall system with all related accessories required for a complete and weathertight system.

WARRANTY: Provide written TWO (2) year guarantee on workmanship, including 24 hour response to written notice by Owner of leak in wall system. Provide manufacturer's written 20 year minimum warranty on metal finish.

CERTIFICATION: The Roofing Contractor will provide written certification and evidence to the Owner that the roof as installed meets UL certification for Class A fire rating and 80 mph wind speed rating. Documents to be approved by State Building Codes Bureau.

APPLICATORS: Have all work done by applicators approved by manufacturer of materials and a minimum of FIVE (5) years experience in single ply roof installation.

PRE-APPLICATION REQUIREMENTS:

- Review drawings and specifications with Manufacturer to insure that the materials are properly used.
- Submit a report including any revised details to Architect. Any revised details, approved by Architect, will be incorporated in the project at no additional cost to the Owner.
- Notify Architect at least 48 hours prior to starting Work.
- Roofing contractor is responsible for "total roof system" including UL rating, all sheet metal flashing work, and compliance with roof edge standards.
- The Roofing Contractor will purchase and maintain a copy of ***The NRCA Roofing and Waterproofing Manual, Latest Edition*** and comply with their recommended details as a minimum unless the Roofing Manufacturer's details have higher requirements.

MANUFACTURER'S SPECIFICATIONS: Manufacturer's specifications, drawings, component information and material properties are herein considered a part of this document and it is the responsibility of the roofing contractor to obtain the latest edition and comply with it.

MATERIALS:

Roof/Wall Panels: 26 GA. corrugated ***Galvalume*** finished steel equal to **METAL SALES *IC72-Panel – Roof/Wall***. Exposed fasteners with heads colored to match panel.

Liner Panels: 29 GA. **METAL SALES *Classic Rib*** white interior panel. Exposed fasteners with heads colored to match panel.

Fasteners: Use corrosion resistant No. 8 x1" Type "W" screws with head type recommended for condition. For other connections, corrosion resistant, as recommended and approved by manufacturer for specific decks and conditions shown on drawings. Indicate fasteners being used on shop drawings.

Closures, Trim & Flashings: Same gauge and finish as exterior panels. Use factory formed shapes wherever possible and custom shapes as required by each specific condition. Where indicated, provide closed cell foam closures along with factory formed metal closure trims to protect the foam.

Foam Closures: **EMSEAL *AST Hi-Acrylic*** metal building foam sealant sized for panel corrugations and where indicated on drawings.

Caulking and Sealants: See 07920-Caulking & Sealants.

Fascia & Soffit System: See 06200-Finish Carpentry.

Snow Guards: 20GA. Galvalume steel shape (see drawing) set in butyl tape. Stitch screw w/ neoprene gaskets into every other top rib. Start first guard 18" back from gutter along the inclined roof plane; then 2 more guards @ 7' O.C. See elevations and sections for locations.

APPLICATION: Install in strict conformance with Manufacturer's specifications, details and instructions. Take SPECIAL CARE in installation to avoid marks, discoloration's, drippings, etc. that might affect appearance. Remove such marks before final payment.

Wall Panel System: Install wall system over specified underlayment.

Roof Panel System: Install roof system over membrane underlayment in strict accordance with manufacturer recommendations and procedures for a water-tight assembly.

END OF SECTION

07 60 00 - FLASHING & SHEET METAL

GENERAL REQUIREMENTS: Per DIVISION 7 - THERMAL & MOISTURE PROTECTION.

GUARANTEE: Per GENERAL CONDITIONS, furnish a written guarantee that all sheet metal work is unconditionally guaranteed to be watertight and free of defects for a period of TWO (2) years, or for the same period as the roof guarantee, whichever is greater.

WORK INCLUDED: Provide flashing and sheet metal not specifically described in other sections but required to prevent penetration of water through the exterior shell of the building and as indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

QUALITY ASSURANCE: Use adequate numbers of skilled workmen with at least THREE (3) years experience in the necessary crafts and who are completely familiar with the methods needed for proper performance of the Work of this Section.

In addition to complying with pertinent codes and regulations, comply with recommendations contained in current edition of "Architectural Sheet Metal Manual" published by the Sheet Metal and Air-conditioning Contractors Association (SMACNA). Where copper is used, also comply with details and recommendations of Copper Development Association (CDA) "Copper Brass Bronze Design Handbooks"

MATERIALS:

Roof Flashing: Flashing and counter-flashings shall be G90 galvanized of gauges noted or specified and of shapes and sizes shown.

Pre-finished Flashings: Form from 26 gauge, 20 year, pre-finished aluminized sheet steel equal to **METAL SALES *Galvalume*** finish. Use concealed "S" clips to join fascia lengths.

Tape Sealant: Mastic for side laps, end laps and flashing to be butyl rubber, pressure sensitive tape mastic. The sealer will be non-asphaltic, non-shrinking, non-drying and non-toxic; and shall have superior adhesion to metals, plastics and painted surfaces at all temperatures.

Head Flashing: Unless Noted Otherwise, provide a standard pre-finished aluminum flashing across the head of all window frames, door frames, wall louvers/vents or similar wall penetrations.

Seamless Gutter System: Provide standard 5” seamless aluminum box gutter and downspout system with 4’ hinged leaders. Color as selected from standard.

Roof Jacks: ITX BUILDEX aluminum and PVC pipe flashing or approved equal. Set flashings with double strips of SIKA SikaLastomer 65 tape and screw to panels at 1" centers. Coordinate penetration locations with subcontractors to avoid cutting ribs wherever possible.

EXECUTION:

General: Flashings and counter-flashings shall be installed at the junction of roofs with vertical surfaces and at all points as shown or necessary to make the building watertight. Counter-flashing will be installed as roofing work is done. Counter-flashing shall extend down to the intersection of roofing with wall and shall be lapped well at joints and around corners.

Weatherproofing: Where seams are required to be waterproof use single lock seams minimum 1/2" wide sweated full of solder. Where lap seams are not soldered, lap according to pitch, but in no case less than 3". Make flat and lap seams in the direction of flow.

Fabrication: Fabricate sheet metal flashing to shapes and sizes detailed, allowing sufficient material for up-standing leg. Make surfaces free of waves and buckles, with lines, arises, and angles sharp and true. Form in strict accordance with Drawings and notes. No raw, exposed edges permitted, turn exposed edges back 1/2".

Joints: Join parts with rivets or sheet metal screws where necessary for strength and stiffness. Provide suitable watertight expansion joints for runs of more than 40', except where closer spacing is indicated on drawings.

Nailing: Whenever possible, secure metal by means of concealed clips or cleats, without nailing through exterior metal. In general space nails, rivets, and screws not more than 8" apart and, where exposed to the weather use rubber washers.

TESTS: Upon request of the Architect, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

END OF SECTION

07 90 00 JOINT PROTECTION

GENERAL REQUIREMENTS: Per DIVISION 7 - THERMAL & MOISTURE PROTECTION.

GUARANTEE: Per GENERAL CONDITIONS, Work guaranteed for a period of FIVE years.

APPLICATION: Apply materials in strict accordance with manufacturer's printed directions, observe manufacturer's requirements regarding temperature control, usability of materials and protection of adjacent surfaces. Clean surfaces to receive sealant with solvents and prime as recommended by sealant manufacturer. Make sealing surface slightly concave, free of wrinkles and skips, uniformly smooth and with perfect adhesion along both sides of joint. Surface is to be shaped with the aid of a formed specialty tool such as DAP 18570 Dap Cap Caulk Finishing Tool, or ProCaulk Caulking Tool Pro. Protect adjacent surfaces from excess material by masking parallel to the joint both sides; leave joints in a clean, neat condition. Defective joints shall be removed, cleaned and replaced at no additional cost to Owner at anytime during the five year warranty period.

MATERIALS:

Sealant: ***DOW CORNING 790 Building Sealant*** or ***G.E. "SilPruf***' Silicone Construction Sealant. Primer as required for specific surfaces. Color as selected. Use on interior/exterior non-porous joints involving metal, tile or glass requiring a cleanable waterproof joint.

Clear Paintable Sealant: **Sashco *LEXEL*** co-polymer rubber. Use on interior/exterior joints requiring either a clear or paintable water-resistant joint.

Window/Door Sealant: **OSI *Advantage*** modified silicone polymer. Use on exterior joints to seal window and door frames to adjacent materials.

Interior Cosmetic Sealant: **OSI *H2U*** or **DAP *Dynaflex 230*** water-base latex caulk. Use on interior painted cosmetic joints.

Sealant: Equal to **SIKA *Sikaflex-15LM*** against metal and ***1-A*** concrete to concrete, one-part polyurethane sealant, Primer as required for specific surfaces. Color as selected. Use on exterior joints requiring a durable waterproof joint.

Self-Leveling Sealant: Equal to ***SIKA "Sikaflex-1CSL***.

Insulating Sealant: High quality commercial polyurethane equal to **Dow *Great Stuff*** foam sealant; minimal expanding. Provide manufacturer information to Architect prior to use. Use in rough openings of all doors, windows, plumbing, mechanical and electrical penetrations through insulated walls, ceilings, attics or foundation walls.

Butyl Sealant: **TREMCO *General Purpose Butyl Sealant***. ASTM C 1311, butyl or polyisobutylene, single component, nondrying, non-skinning, non-curing. Use for sealing gutters, downspouts, and other metal flashings and trims on roof.

Butyl-Tape: Extruded polyisobutylene tape ***Sikalastomer 82-6W*** as manufactured by **Sika Corporation**. Use to seal flashing and curb penetrations through metal roof panels.

Back-up Material: Foamed polyethylene or polystyrene rod stock, sizes as required by joint condition. Use on joints greater than 3/8".

APPLICATION:

A. Apply only to clean and dry surfaces, using a primers and cleaning agents as recommended by the manufacturer for the material being sealed.
B. All caulked joints are to have a smooth tooled "concave" surface (as described above). Irregular, flat or convex joints will be rejected.
C. All joints greater than 3/8" wide will be backed with a round poly rod to form a double concave shape sealant joint.

END OF SECTION

DIVISION 8 - OPENINGS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Division.

SCOPE: Supply and install all doors and windows as shown on Drawings and as specified herein.

SHOP DRAWINGS: Per SUPPLEMENTARY GENERAL CONDITIONS, submit the required sets of complete construction and erection details.

CODES: Comply with applicable Fire and Building Codes and Underwriters' Laboratories, Inc. "Building Materials List".

GUARANTEE: Per GENERAL CONDITIONS, guarantee all Work in this Division for TWO (2) years.

MEASUREMENTS: Verify all dimensions by taking field measurements; proper fit and attachment to adjoining Work is required.

COORDINATION: Coordinate Work and scheduling with other trades.

INSPECTION: Prior to installation, inspect all surfaces to which doors and windows must be fitted. Report in writing to Architect any conditions detrimental. Failure to observe this injunction constitutes a waiver to any subsequent claims and holds Contractor responsible for any corrections Architect may require.

DELIVERY AND STORAGE: Deliver and store materials in a protected area. Cover materials as required to prevent dust accumulation and damage to finish. Replace damaged or defective items at no cost to Owner.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS.

END OF DIVISION

08 11 00 - METAL DOORS AND FRAMES

GENERAL REQUIREMENTS: Per DIVISION 8 - OPENINGS.

FABRICATION:

A. Fabricate doors to sizes shown; provide necessary clearances and bevels to permit operation without binding and to accommodate thresholds where required.
B. Include reinforcements and mortising for all required hardware, specified under SECTION 08700 - FINISH HARDWARE, from templates furnished thereunder. Reinforce all butt cutouts with minimum 3/16 inch thick steel plate, drilled and tapped and welded in place.
C. Clean thoroughly, phosphatize and prime with factory baked-on neutral gray rust-inhibiting paint, tested as per ASTM D-714 and B-117.

DOORS:

A. Interior Doors: Equal to Level I, Flush, 20 ga. Non-handed honeycomb core, or mineral core for rated doors, CECO "Omega". Factory primed finish.
B. Exterior Doors: Equal to Level II, Flush Heavy Duty, 18 ga. Expanded polystyrene core composite R-14 insulating value, CECO "Legion". Factory primed finish.
C. Mortise, reinforce, drill and tap doors at factory for mortised hardware. Reinforce for surface hardware, such as checks, escutcheons, etc. for drilling and tapping in field.
D. Construct doors to UL requirements where scheduled on Drawings; provide labels.
E. Provide lights and louvers in metal doors and reinforce cutouts as required. Provide removable glazing stops on one side only with mitered corners; louvers shall be standard type "V" shaped blades.

END OF SECTION

08 30 00 – SPECIALTY DOORS AND FRAMES

GENERAL REQUIREMENTS: Per DIVISION 8 - OPENINGS.

CEILING ACCESS DOOR: Equal to **William Bros.** Model DW 400: 22 x 30" size. Install in strict accordance with manufacturer's recommendations. Provide (1) confirm size.

END OF SECTION

08 36 10 SECTIONAL DOORS

GENERAL REQUIREMENTS: Per DIVISION 8 - OPENINGS.

GENERAL: Provide each sectional overhead door as a complete unit including frames, sections, brackets, guides, tracks, weather-stripping, counterbalance mechanisms, hardware, operators and installation accessories to suit openings and head-room.
Wind Loading: Design for Class B 25 psf wind load. Provide reinforcing strut at top of door to prevent temperature bowing.

WARRANTY: FIVE (5) years against delamination between foam and skin.

MATERIALS:
Door Sections (Insulated): Sections shall be manufactured by a foam-in-place process resulting in a homogeneous sandwich of even textured polyurethane insulation of a metal/foam/metal construction. Steel skins shall have a thermal break to prevent heat from shunting around the door. Each section shall have a baked-on finish paint (white). Each door section shall meet these minimum requirements: Minimum section thickness: 2". Minimum section R-value: R-13.

Vision Panels: Each door shall be equipped with a single row of standard lites in the third section from the ground unless otherwise specified. Standard size glazing to be 25" x 12" maximum. Glazing material shall be double thermal acrylic, 1/8" thick panes and 1/4" air space. Standard panes shall be sealed to door section by an EPDM rubber gasket attached with hot glue, to provide weathertight sealing.

Weatherstripping: Doors shall be supplied with a total weather-stripping package to seal at top, bottom, jambs and instructions, there shall be no detectable air leakage and no visible light transmission around door.
A. Door package to have rubber bulb-joint seals between sections and galvanized steel caps.
B. Head and jamb shall have nylon or polypropylene brush fiber weather-stripping; Equal to: PEMKO 18275CP head and 45125CP jambs.

Track And Supports: Track shall be continuously mounted reverse angle, constructed of heavy-gauge galvanized steel designed for clearances shown. Provide complete track assembly including brackets, bracing, and reinforcing for rigid support of the track for the required door type and size. Provide standard headroom track. **3" track shall be 12 gauge** (minimum) unless otherwise specified.

Hardware: All hardware to be 14 gauge (minimum) galvanized steel.
NOTE: Provide industry standard at all hinge and fastener locations.

Roller Brackets: Provide heavy-duty fully adjustable roller brackets to each end reinforcement plate per manufacturer's recommendations.

Rollers: Provide heavy-duty rollers, with 10 steel ball bearings in case-hardened inner and outer steel races. Extend roller shaft through both brackets where double brackets are required.

Step Handles: Provide attaching step handle for inside of door.

Locking System: Provide an interior slide bolt and handle, outside keyed locking handle. Doors in same building keyed alike.

SPRING COUNTERBALANCE: Heavy-duty, oil tempered, wire torsion, 25,000 cycle springs on continuous ball bearing cross header shaft. Springs shall be engineered for an industrial application and shall comply with durability properties specified under National Association of

Garage Door manufacturer's specification 101-1975.

LIFT CABLES: Shall be galvanized, aircraft-type lift cables with a minimum safety factor of 7.

ELECTRICAL DOOR OPERATORS: All overhead doors scheduled to be installed shall be adequately reinforced, as recommended by the door manufacturer, for installation of electrical door operators. Electrical door operator shall be center mounted drawbar trolley type, 120V, 1/2 or 3/4 horse power, single phase, over current and low voltage protected. Reversing contactor shall be heavy-duty across-the-line type with mechanical interlock. Line voltage shall be reduced to 24 volts for control circuit. Operator shall have limit switches mounted in steel NEMA-1 enclosures: Control shall be by a three-button (open, stop, close) switch mounted near the jamb on the inside of the building, by an electric door safety edge, and by remote transmitter, with adjustable frequency. Provide (1) transmitter per door, frequency keyed differently.

Electric Door Operator to be **Lift-Master *T-5011*** Industrial Duty Trolley Operator.

APPROVED DOOR MANUFACTURERS AND MODELS: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

Midland 3" Energy Saver, 20 ga. exterior face.
Wayne Dalton Thermospan 200-20
Raynor Tri-Core, 20 ga. exterior face.
Clopay 3” 3300, 20 ga. exterior face.
Steelcraft Therm-O-Dor: TD134-20

Note: Any other manufacturers requesting their product approval shall submit all necessary materials to the Owner in accordance with the "prior approved equal" status of the General Conditions of this contract.

INSTALLATION:

A. Contractor shall notify field maintenance bureau chief at least one (1) week in advance of installation.
B. Install doors as per manufacturer's recommendations, plumb and square.
C. Any damaged parts shall be rejected and replaced at no extra cost to the Owner.
D. Doors are to be installed so there is no visible light transmission and no detectable air leakage through or around the door.
E. Special care will be taken in setting sheet metal screws so they do not strip out their holes.
F. Contractor shall provide a one (1) year written warranty covering defects in the installation of the overhead doors.
G. Contractor shall furnish Owner with one set of installation and maintenance brochures.

END OF SECTION

08 54 13 – FIBERGLASS WINDOWS

GENERAL REQUIREMENTS: Per DIVISION 8 - OPENINGS.

Fiberglass Windows: Units to be pre-finished, insulated fiberglass frame, Single-hung Commercial type windows with the following preferred specification requirements:

NOTE: Preferred table of window specifications represent the desired combination of features. We understand that not all windows will meet all of these specifications and will review the list of windows bid to the General Contractor and choose the one with the best cost/benefit to Owner.

ITEM	**SPECIFIED**
Glass Type	Tempered Low E 366 + Neat + Film + Argon
NFRC Glass U-factor	0.25
NFRC SHGC Heat Gain	0.27
NFRC VT Light Transmittance	0.66
NFRC AL Air Leakage	0.05 cfm/l.f. @ 25 mph
Design Pressure Rating	DP +40/-40 psf
Frame Type	Insulated hollow Fiberglass
Finish	Baked-on powder-coat finish, Standard Color
Major Weatherstrip Type	Q-Lon kerfed-in
Interior Finish	Same as exterior
Grilles	¾" as shown on elevations
Screen Type & Frame	Fiberglass + extruded frame
Forced Entry	Level 10 min.
Condensation Resistance	CR 55

A. Sill Flashing: **Tyvek *FlexWrap & StraightFlash*** window flashing flexible self-adhering butyl membrane or **Jamsill, Inc. *Jamsill Guard*** rigid polypropylene pan system or equal. Install system in strict conformance with manufacturer's directions.
B. Installation: Inspect rough opening for square and plumb. Install sill and head flashing as specified. Install windows plumb and true, fully secured, in strict accordance with manufacturer's literature. Extra caution must be exercised when temperatures drop below freezing. Protect windows from damage by other trades until finish work is completed.
C. Exterior Finishing: Caulk around perimeter of window with silicone sealant after exterior finish is applied.
D. Cleaning: Per GENERAL REQUIREMENTS.
E. Insulation: Foam rough opening cracks over 1/4 inch and calk cracks less than 1/4 inch before installing finish trim.
F. Warranty: Provide manufacturer's written TEN year warranty for all parts of the window except glazing. Provide glass manufacturer's written TWENTY year warranty for the glazing portion of the window assembly.
G. Manufacturer's: The following manufacturer's are approved for bidding, others to submit request for approval:
   - **ALPEN ENERGY GROUP**
   - **PELLA: *Impervia Series***
   - **MARVIN**: ***All Ultrex Series***

END OF SECTION

08 62 10 - TUBE SKYLIGHTS

GENERAL REQUIREMENTS: Per DIVISION 8 - OPENINGS.

UNIT SKYLIGHTS:

A. Manufacturer: **Solatube International Inc.**; provide ***290 DSe Brighten Up*** 14" dia. skylight system, model S290DSe-DA-FPT12-E3-L4-I.

B. Installation: Install skylights plumb and true, fully secured, in strict accordance with manufacturer's literature. Extra caution must be exercised when temperatures drop below freezing. Protect from damage by other trades until finish work is completed.

C. Exterior Finishing: Using the flashing jack and turret extension, install skylight in pitched shingle roof per manufacturer directions for a watertight system.

D. Cleaning: Per SECTION 1A - SPECIAL CONDITIONS.

E. Insulation: Foam rough opening cracks over 1/4 inch and calk cracks less than 1/4 inch before installing finish trim.

F. Security Diffuser: Provide a 3/8" X 14" dia. Polycarbonate cover for ceiling opening. Secure with tamper-proof security screws and washers and clear sealant. See Drawings.

APPROVED MANUFACTURERS: Provide information prior to Bid for approval by Architect for alternate manufacturers/systems.

END OF SECTION

08 70 00 HARDWARE

GENERAL REQUIREMENTS: Per DIVISION 8 - OPENINGS.

RELATED SECTIONS: Provide hardware under this section as part of 08 41 00 Aluminum Entrance section.

GENERAL: While Hardware Schedule is intended to cover all doors and other movable parts of the building and establish a type and standard of quality, examine Plans and Specifications and furnish proper hardware for all openings whether listed or not. If there are any omissions in hardware groups, call them to the attention of Architect prior to bid opening for instructions; otherwise list will be considered complete. No extras will be allowed for omissions, changes, or corrections necessary to facilitate proper installation.

TEMPLATE HARDWARE: Have any hardware applied to metal doors and jambs made to template and secured by machine screws. Furnish reinforcing units for any metal doors where cylindrical locks are specified. Furnish any templates, lock reinforcing units, and template hardware to metal door and frame manufacturer for application at factory, unless otherwise requested.

FASTENING: Furnish hardware with all necessary screws, bolts or other fastenings of suitable size and type to anchor hardware in position for heavy use and long life. Fastenings shall be furnished where necessary with expansion shields, hex bolts, toggle bolts, anchors according to the material to which it is applied and as recommended by manufacturer, subject to approval of Architect. Furnish hardware fastened to concrete with expansion shields of type approved by Architect. Screws going into wood: full threaded sheet-metal type. Use LOCK-TITE on fasteners to secure ALL hardware to steel or aluminum framing.

INSTALLATION: Fit hardware on doors prior to finishing and painting and then remove and complete painting before final installation.

MANUFACTURERS:

Butts	STANLEY or equal
Locks	BEST or equal
Stops	TRIMCO or equal
Exit Devices	VON-DUPRIN, SARGENT or CORBIN-RUSSWIN
Closers	NORTON, LCN or RIXSON
Push/pulls	TRIMCO
Kick Plates	TRIMCO
Weather-stripping	PEMKO or equal
Thresholds	PEMKO or equal
Door Openers	HORTON
Finish Designation	US26D (ALU on closers)

KEYING: Provide cylinders for all doors. Key to Owner's system. Furnish TEN (10) keys per door stamped 'DO NOT DUPLICATE'.

GUARANTEE: All finish hardware ONE (1) year, door closers FIVE (5) years.

END OF SECTION

DIVISION 9 - FINISHES

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Division.

SCOPE: Supply and install all Finish Work as shown on Drawings and as specified herein.

MEASUREMENTS: Verify all dimensions shown on Drawings by taking field measurements; proper fit and fastening of all components is required.

GUARANTEE: Per GENERAL CONDITIONS.

COORDINATION: In all Work under this Division, coordinate with all other Trades whose work connects with, is affected or concealed by Finish Work. Before proceeding, make certain all required inspections have been made.

INSPECTION: Inspect surfaces to receive finishes before starting Work and do not start until surfaces are acceptable. Starting Work under this Division implies acceptance of surfaces.

DELIVERY AND STORAGE: Deliver all manufactured materials in original packages bearing manufacturer's name and brand. Use only one brand of each material throughout job. Store materials in dry place.

STANDARDS: Comply with all applicable requirements of the following codes and references, latest edition, except where more stringent requirements are called for herein or by local codes:

A. U.S.G. Red Book of Lathing & Plastering.
B. U.S.G. Drywall Construction Handbook.
C. The Council of America - Tile Handbook.
D. National Terrazzo and Mosaic Association - Terrazzo Specifications and Technical Data.
E. Acoustical Materials Association - Architectural Acoustical Materials.
F. Painting and Decorating Contractors of America Manual.
G. Gypsum Association Fire Resistance Design Manual, latest edition.

INSTALLER: Perform all Work herein by experienced applicators or installers with a minimum of FIVE (5) years experience in the trade.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS, remove all excess material, equipment and debris; dispose of away from premises. Leave Work in clean condition.

END OF DIVISION

09 29 00 – GYPSUM BOARD

GENERAL REQUIREMENTS: Per DIVISION 9 - FINISHES.

GENERAL: Do all cutting and patching required to accommodate work of other trades. Maintain temperature of drywalled spaces in range of 55 degrees to 90 degrees F. until building is entirely enclosed and ventilate to eliminate excessive moisture.

INSTALLATION:

A. Apply boards with long dimension to framing members with all abutting ends over supports. Neatly fit and stagger all end joints. Make joints occur on different studs at opposite sides of partition. Cut and fit neatly around all outlets and switches. Space fasteners 8" on center along vertical edges, and 12" on center at midpoints, 3/8" from edge of board. Fasten boards to backings specified. All gypsum board attached with gypsum board screws. "Dri-Tite" nails may be used to "tack" boards in place before screwing.
B. Erection technique shall result in plumb and straight surfaces with no waves or buckles, free of unevenness at joints.
C. Joints wider than 1/8" will be cause for rejection of board surface by Architect.
D. If framing members are out of alignment, bowed or warped, correct to make true surfaces before application of gypsum board. Use method of correction approved by Architect. Make finish walls or ceilings plumb and level without ridges, bows, or warps.

TAPING AND FINISHING:

A. Mix joint and finishing compounds per manufacturer's directions.
B. Center tape over joint and embed in uniform layer of joint compound of sufficient width and depth to provide firm and complete bond. Apply skim coat while embedding tape.
C. Treat angles with reinforcing tape folded to conform to adjacent surfaces and straight true angles.
D. Allow compound to thoroughly dry for at least 24 hours.
E. Over joint compound and tape apply coat of finishing compound. Spread evenly and feather out beyond edge of board. After first finishing coat is thoroughly dry (at least 24 hours) cover with second coat with edges feathered out slightly beyond preceding coat.
F. Give all dimples at fastener heads and all marred spots on surface of board one coat joint compound and two coats finishing compound, applied as each coat is applied to joints.
G. Install corner reinforcement at all external corners. Conceal flanges of reinforcement with at least two coats of compound. When completed compound shall extend approximately 8 inches to 10 inches on each side of nosing.
H. After each application of joint or finishing compound has dried, lightly sand all joints. Leave all board and treated areas uniformly smooth and ready for painting.

FINISH LEVELS: In general, use Gypsum Association, latest edition recommendations for finish levels in appropriate areas and over recommended materials. Otherwise finish as described below:

Textured Walls: Walls receiving texture or wallcovering finish to Level 4.

Smooth Finish Walls: Level 4.

Smooth Finish Epoxy Painted: Level 5.

WALLBOARD MATERIALS:

Gypsum Board: Conforming to ASTM C-36. 5/8 inch thick x 4 feet wide, fire resistive gypsum board, Type X. All toilet, shower room walls, kitchen walls and janitor rooms with utility sinks to receive 5/8" **GP *DensArmor Plus Fireguard*** gyp board on walls and adjacent walls having plumbing fixtures. In rooms where DensArmor is not scheduled in the Finish Schedule, but there is a sink, provide 8 l.f. of DensArmor up 4' centered on the sink. If the sink is near a corner turn it with the DensArmor and carry to front of counter minimum.

Trim and Edging: "Glue-on" vinyl corners with edges for bedding cement. Provide radiused corner pieces with 1 1/4 inch legs at all outside corners and channel type metal or vinyl trim pieces as detailed at all gypsum board edges meeting dissimilar materials. Use trim and accessories equal to **350 Bull** to form a complete system. For gyp board flat-taped to dissimilar materials such as tubs, showers & window frames use **TRIM-TEX *L Bead***. Where reveal joints are shown on plans use **Trim-Tex *Architectural Reveal Bead.***

Screws: Blued steel, bugle shaped, counter sunk Phillips heads, Type S for steel studs and Type W for wood studs, of lengths as required to accommodate thicknesses of wall and ceiling construction.

Drywall Stops: Equal to **Simpson *DS*** used to replace blocking at intersections of walls and ceilings 16" o.c. maximum spacing. Do not use in lieu of blocking shown on plans.

Control Joints: Equal to **USG** #093 or **Trim-Tex *Architectural Reveal Bead.*** Provide on any finished wall or ceiling surfaces that exceed 32' in any direction so surfaces are evenly broken and once required, so joints occur no further than 24' apart in either direction.

SYSTEMS:

Standard Int. Partitions: 5/8 inch Type-X gyp. board screwed to both sides of 2x studs @ 16".

END OF SECTION

09 90 00 - PAINTING & COATING

GENERAL REQUIREMENTS: Per DIVISION 9 - FINISHES.

SAMPLES: Per SUPPLEMENTARY GENERAL CONDITIONS, submit samples of all types of finishes specified herein. Before Work is begun, Architect will furnish Contractor a color schedule of colors selected from manufacturer's stock colors.

SURFACE PREPARATION:

A. Protect items not to be painted or remove prior to painting. If required to be removed, reposition after painting.
B. Make any exposed miscellaneous metal items, such as steel supports, anchors, bucks, hollow metal frames and the like clean, free of rust, dust, grease and dirt.
C. Clean any visible portions of throats of galvanized steel ductwork with solvent, wipe dry with clean rags and paint flat black.
D. Wash any unprimed factory sealed galvanized metal with a solution of "Galva-Prep SG" and 3M Scotch-Brite pads; non-sealed galvanized metal may be solvent wiped, followed by an acid etch and water rinse.
E. Make any wood surfaces to be painted or stained clean, smooth, dry, and fully sanded. Knots and pitch pockets under paint finish shall be sealed with shellac. Fill joints, cracks, nail holes, disfigurations, etc. with plastic wood after priming; then sand smooth.
F. Clean and etch all concrete, masonry or plaster surfaces with a phosphoric acid solution reduced with water to eliminate efflorescence. Seal any similar surfaces to be painted and fill to smooth, even surfaces. Remove grease or oil with benzene.
G. Clean thoroughly any wallboard surfaces to be painted. Spackle any nail holes after primer has dried. Sand smooth all rough surfaces.

APPLICATION:

A. During interior application, maintain minimum temperature of 60 degrees F. unless otherwise directed by Architect or manufacturer's printed instructions. Hold temperature constant as possible. Provide adequate ventilation at all times so the humidity cannot rise above the dew point of the coldest surface to be painted. Do no exterior painting below 40 degrees F or at any temperatures within 5 degrees F of the dew point.
B. Paint all exposed surfaces of every member; paint anything inaccessible after installation before installation, if required to be painted.
C. Paint no items fitted with finish hardware until hardware has been temporarily removed.
D. Sand carefully between coats all finishes on smooth surfaces for good adhesion of subsequent coats.
E. Where coverage is incomplete or not uniform, provide an additional coat at no extra expense to Owner.
F. Each succeeding pigmented coat shall be distinguishably lighter than the previous coat. Tint all prime and undercoats to color similar to finish coat.
G. Apply putty, caulk or spackle after surface is primed and primer is dry.
H. Apply all coatings without reduction except as specifically required by label directions, or required by this Specification.
I. Apply with brush, roller or spray and back-roll. Spray only is prohibited on any drywall surfaces. Spray is allowed on metal surfaces such as door frames.

MISCELLANEOUS PAINT ITEMS: Include painting of the following items, unless specifically noted pre-finished: Red iron exposed both interior and exterior. Exterior PVC plumbing vents. Exterior exposed iron piping and interior exposed piping & sprinkler lines in finish spaces, exterior mechanical wall louvers, curbs and roof ventilation equipment.

MATERIALS: Provide commercial quality painting systems with specifications meeting or exceeding those scheduled below under Painting Systems.

COMPLETION AND CLEANING: On completion of Work, carefully clean all glass, hardware, etc., and remove all misplaced paint and stain spots or spills and leave Work in a condition acceptable to Architect.

PAINTING SYSTEMS: It is the intent of this Specification to establish procedure, quality, and number of coats; the Architect will determine the exact finish desired. Do not start priming or painting without having notified the Architect. All surfaces specified herein to receive 3 coats (primer + 2 finish) will receive 3 coats; there will be no exceptions. Tinting of primer is not allowed. First finish coat tinted a shade off of second coat. Apply the following finishes to the areas designated, Sherwin-Williams product numbers shown for reference to establish quality levels:

Type 2 (ferrous metals, hollow metal doors, frames, etc.)
First Coat – Alkyd primer
Second Coat - Semi-gloss Exterior Alkyd Enamel
Third Coat - Gloss Exterior Alkyd Enamel

Type 6 (Epoxy coated interior drywall surfaces)
First Coat - B28WF6000 High Build Interior Latex Drywall Primer (Use 1.5” lambswool roller)
Second Coat – Pro Industrial Hi-Build Water-Based Catalyzed Epoxy (Semi-gloss)
Third Coat - Pro Industrial Hi-Build Water-Based Catalyzed Epoxy (Semi-gloss)

Finish Type 8 (smooth finish drywall in general use spaces)
First Coat - B28WF6000 High Build Interior Latex Drywall Primer (Use 1.5” lambswool roller)
Second Coat - ProMar Zero VOC Interior Latex Flat (or tinted semi-gloss)
Third Coat – ProMar Zero VOC Interior Latex Semi-gloss

Finish Type 9 (GBO finish drywall in general use spaces)
First Coat – B28WF6000 High Build Interior Latex Drywall Primer (Use 1.5” lambswool roller)
GBO Texture Coat- **Apply only after primer/surfacer coat.**
Second Coat – Primer over texture
Third Coat - ProMar Zero VOC Interior Latex Flat (or tinted semi-gloss)
Fourth Coat - ProMar Zero VOC Interior Latex Semi-gloss

END OF SECTION

DIVISION 10 - SPECIALTIES

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Division.

SCOPE: Supply and install all miscellaneous specialty items as shown on Drawings and as specified herein.

SHOP DRAWINGS: Per SUPPLEMENTARY GENERAL CONDITIONS, submit brochures and Shop Drawings of all items showing sizes of members, methods of construction and mounting techniques.

SAMPLES: Where specifically stated herein under the particular item of work, submit TWO (2) samples per SUPPLEMENTARY GENERAL CONDITIONS.

GUARANTEE: Per GENERAL CONDITIONS.

MEASUREMENTS: Verify all dimensions shown on Drawings by taking field measurements; proper fit and attachment of all parts is required.

COORDINATION: Coordinate, cooperate with all trades whose work relates in any way to items specified herein so Work progresses smoothly and without delay.

INSPECTION: Examine all subsurfaces to receive Work and report in writing to General Contractor, with a copy to Architect, any conditions detrimental to Work. Failure to observe this injunction constitutes a waiver to any subsequent claims to the contrary and makes Contractor responsible for any corrections Architect may require. Commencement of Work will be construed as acceptance of all subsurfaces.

DELIVERY AND STORAGE: Deliver and store all items in dry, protected areas. Keep free of corrosion or other damage, Replace any damaged items, or parts, at no cost to Owner.

ANCHORAGE: Furnish and install all anchorage devices required to install the item and its appurtenances, complete. Provide anchorage in ample time when required to be built in by other trades.

INSTALLATION: Install all items not called for to be installed by manufacturer or supplier. Install per details on Drawings, manufacturer's printed installation instructions and any additional requirements specified. All wall-mounted items shall be securely fastened to solid backing or blocking.

PROTECTION: Protect all items from damage during installation and storage until building is accepted by Owner. Repair or replace damaged items with no additional cost to Owner.

CLEAN-UP: Per SUPPLEMENTARY GENERAL CONDITIONS.

END OF DIVISION

10 10 00 - SPECIALTIES

GENERAL REQUIREMENTS: Per DIVISION 10 - SPECIALTIES.

FIRE EXTINGUISHERS:
Provide (1) **JL Industries** *Cosmic 10E* or equal extinguisher. Location shown on plans.

GRAB BARS: **Bradley** *832-2-001* series, length per Plans, mounted at between 33" & 36" centerline from floor. Provide (1) 42" length, (1) 36" length units and (1) 18" length.

PLATE WALL MIRRORS: **Bradley** #*781-1830* 18 x 30" with mounting clips or equal. Provide (1) centered over restroom sink with the bottom at 40" AFF max.

PAPER HOLDERS: **Bradley** #*508* or equal. Provide (1). Mount at 20" min. O.C. from floor.

HOIST & TROLLEY: **Harrington** CF hand chain w/ PT push trolley or equal; 1000# capacity.

APPROVED MANUFACTURERS:

Bathroom Specialties:	**ASI, Bobrick, Bradley**
Fire Extinguishers:	**JL Industries, Larsens Mfg, Potter-Roemer Smith**

END OF SECTION

DIVISION 31 – EARTHWORK

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply.

AS-BUILT DRAWINGS: Per SPECIAL CONDITIONS.

SCOPE: Complete all Site Drainage and Utility Work as shown on the Drawings and as specified.

CONDITIONS AT SITE: Visit the site. Examine and note all conditions as to the character and extent of Work involved. Protect any adjacent property and improvements from damage and replace any portions damaged through this operation. Maintain all bench marks, control monuments, and stakes, whether newly established by Surveyor or previously existing. Protect from damage and dislocation. If necessary to disturb existing bench marks, re-establish in a safe place.

PERMITS & ORDINANCES: Procure and pay for all necessary permits or certificates required by local authorities having jurisdiction over the Work. Comply with all Federal, State and Local Laws.

COORDINATION: Cooperate and coordinate the Work with the various Sub-contractors whose work might be affected by operations.

ADJACENT PROPERTY: Restore any damage to adjacent properties, streets, and the like caused by operations of this Division to original condition without additional cost to the Owner.

TESTS: The Foundation Engineer who prepared the Soils Report (if applicable) shall perform all tests and inspections required by this Division. Relative compactions shall be determined as specified in ASTM D-698. Owner will pay for all passing tests; Contractor will pay for all failed tests.

EXISTING UTILITIES: Where existing utilities not shown on the Drawings are encountered: support, shore up, protect same and immediately notify Architect. Allow entrance, opportunity, and ample time for measures necessary for continuance and/or relocation of such services.
Where noted on Drawings, cut and cap all street connections encountered in the excavating along curb line and mark location so they can subsequently be located and re-connected as required.

LAYOUT: Layout and Work under this Division shall be made by competent personnel experienced in surveying. If any discrepancies are found by Contractor between the Drawings and actual conditions at the site, Architect reserves right to make such minor adjustments in Work specified as necessary to accomplish the intent of the Contract Documents without increased cost to the Owner.

CLEAN-UP: Remove from the Site all rubbish, debris, etc. resulting from Work in this Division, except as otherwise specified above, per SUPPLEMENTARY GENERAL CONDITIONS.

WORK IN OTHER DIVISIONS:

A. Existing Conditions – Division 2
B. Concrete – Division 3
C. Exterior Improvements – Division 32

END OF DIVISION

31 23 00 – EXCAVATION AND FILL

GENERAL REQUIREMENTS: Per DIVISION 31 - EARTHWORK.

GENERAL: All work under this section including materials and installation shall conform to **Montana Public Works *Section 02200-Earthwork*** and this specification is incorporated by reference. Any bidder in doubt about these requirements can obtain a copy of the specific section in question from the Architect.

LOCATE CALL: In addition to requesting local utilities to locate underground utilities and per MCA 69-4-501 to 506 the contractor is required by State Law to notify a One-Call location service before all underground excavation. Notification must be received at least TWO (2) working days prior to excavation. Call 1-800-424-5555.

PUMPING AND DRAINAGE:

A. Keep all excavations, pits, trenches, footings, etc. entirely free from water.
B. Protect excavations from rain or water from any source during construction. Use suitable pumping equipment or other means as required by conditions. Continue pumping as necessary until completion of project or until released by Architect.
C. When operations are interrupted by unfavorable weather conditions, prepare areas by grading and compaction to avoid ponding and erosion.

EXCAVATION:

A. Excavate to depths noted on Drawings, as required for proper completion of all footings and other subgrade level Work, and cut to sufficient size to provide ample room for the construction of forms, shoring, and bulk-heading as required.
B. Backfill any excess excavation under footings or slabs with engineered gravel at Contractor's expense.
C. Shore and brace excavations where necessary to prevent cave-ins, and in accordance with all safety codes and laws.
D. Excess material not needed for completion of Work is to be disposed of off site by the Contractor.
E. Strip topsoil and store separately for final grading.

TRENCHING: Trenching for underground piping, electrical conduits, etc., shall be done by the trade installing such pipes, conduits, etc. Backfilling of trenches to conform with requirements of Compacted Fill.

FILL AND BACKFILL:

A. ENGINEERED FILL:
    1. Material for all engineered fill shall be non-expansive material. Material may be taken from building area or imported as approved by the Architect before use.
    2. Engineered fill may be continuously inspected and shall be tested in 3 separate locations as directed for compliance.
    3. All fill under interior slabs, paved areas, or specific footings will be engineered fill.
    4. Fill will be placed in layers not exceeding 8" thick after compaction. Compaction of each layer shall be 95% of maximum density at optimum water content per ASTM D698-91.

B. COMPACTED FILL:
   1. Material for compacted fill will be selected from suitable site excavation or imported material.
   2. All fill other than ENGINEERED FILL will be compacted fill.
   3. Compacted fill may be spot tested for compliance.
   4. Fill will be placed in layers not exceeding 8" thick after compaction. Compaction of each layer will be 90% of maximum density at optimum water content.

FINISH GRADING: Perform all finish grading required as indicated or reasonably inferred to permit installation of Work of others or as shown on Drawings. At completion of Work, entire site including any waste fill areas will be left in a clean and finished condition.

END OF SECTION

DIVISION 32 – EXTERIOR IMPROVEMENTS

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply.

AS-BUILT DRAWINGS: Per SPECIAL CONDITIONS.

SCOPE: Complete all Site Drainage and Utility Work as shown on the Drawings and as specified.

CONDITIONS AT SITE: Visit the site. Examine and note all conditions as to the character and extent of Work involved. Protect any adjacent property and improvements from damage and replace any portions damaged through this operation. Maintain all bench marks, control monuments, and stakes, whether newly established by Surveyor or previously existing. Protect from damage and dislocation. If necessary to disturb existing bench marks, re-establish in a safe place.

PERMITS & ORDINANCES: Procure and pay for all necessary permits or certificates required by local authorities having jurisdiction over the Work. Comply with all Federal, State and Local Laws.

COORDINATION: Cooperate and coordinate the Work with the various Sub-contractors whose work might be affected by operations.

ADJACENT PROPERTY: Restore any damage to adjacent properties, streets, and the like caused by operations of this Division to original condition without additional cost to the Owner.

TESTS: The Foundation Engineer who prepared the Soils Report (if applicable) shall perform all tests and inspections required by this Division. Relative compactions shall be determined as specified in ASTM D-698. Owner will pay for all passing tests; Contractor will pay for all failed tests.

EXISTING UTILITIES: Where existing utilities not shown on the Drawings are encountered: support, shore up, protect same and immediately notify Architect. Allow entrance, opportunity, and ample time for measures necessary for continuance and/or relocation of such services.
Where noted on Drawings, cut and cap all street connections encountered in the excavating along curb line and mark location so they can subsequently be located and re-connected as required.

LAYOUT: Layout and Work under this Division shall be made by competent personnel experienced in surveying. If any discrepancies are found by Contractor between the Drawings and actual conditions at the site, Architect reserves right to make such minor adjustments in Work specified as necessary to accomplish the intent of the Contract Documents without increased cost to the Owner.

CLEAN-UP: Remove from the Site all rubbish, debris, etc. resulting from Work in this Division, except as otherwise specified above, per SUPPLEMENTARY GENERAL CONDITIONS.

WORK IN OTHER DIVISIONS:

A. Existing Conditions – Division 2
B. Concrete – Division 3
C. Earthwork – Division 31

END OF DIVISION

Appendix A

TYVEK WRAP INSTALLATION
FLEXWRAP INSTALLATION

DuPont™ Tyvek® COMMERCIALWRAP®

INSTALLATION GUIDELINES

DuPont™ Tyvek® CommercialWrap® ▪ DuPont™ FlexWrap™ ▪ DuPont™ StraightFlash™

Wrapping Vertical Walls

INSTALLATION METHODS

To attach Tyvek® to wood framed construction where the sheathing is plywood, insulated board, glass fiber faced exterior gypsum, or exterior gypsum board, use nails with large heads, nails with plastic washers, or staples with a minimum 1" crown.

To attach Tyvek® to steel framed construction where the sheathing is glass fiber faced exterior gypsum, or exterior gypsum use screws with washers.

Step 1

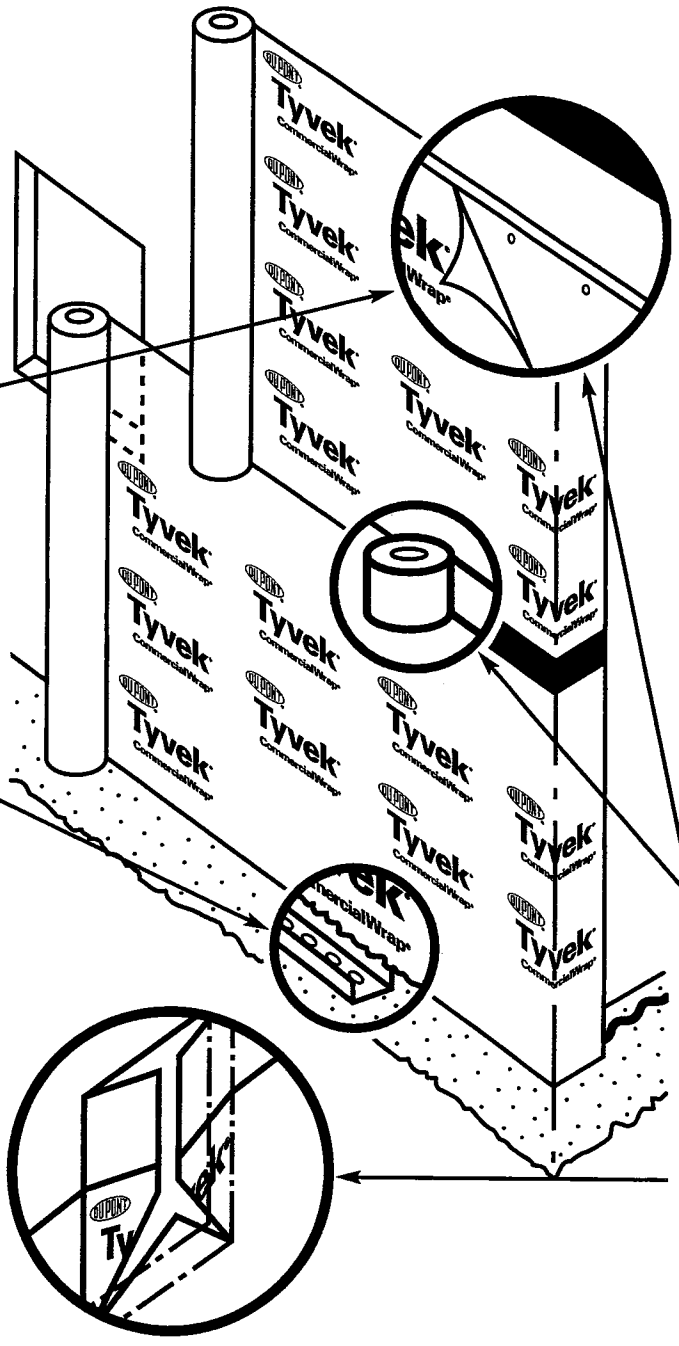
Beginning at the corner of the building, leave approximately 6"–12" of Tyvek® extended beyond the corner edge to overlap later. Hold the roll vertically and unroll for a short distance. Make sure the grid marks on Tyvek® CommercialWrap® are lined up with the first stud. Also, make sure that the roll is plumb and the bottom edge runs parallel to the foundation. Fasten Tyvek® to the corner edge of the building.

Step 2

As best practice, the bottom edge of Tyvek® should always extend over the sill plate interface particularly when a sill sealer is not being used. Secure Tyvek® to the foundation with a polyurethane, elastomeric or latex base joint sealer.

Step 3A

Continue to unroll a few feet at a time, being careful to follow the foundation line. Secure Tyvek® every 12"–18" on the vertical stud line when using plastic cap nails, largehead nails, screws with washers, or 1" crown staples. Ultimate fastener holding power to the Tyvek® weather resistive barrier depends on the sheathing chosen. If the sheathing's mechanical properties permit, securely fasten Tyvek® to it. If the sheathing mechanical properties do not permit reliable fastening of Tyvek®, ensure fasteners penetrate the framing members. Workmanship in fastening Tyvek® CommercialWrap® is important. Optimum performance of Tyvek® may not be achieved if fastener installation is done carelessly. Grid marks printed on Tyvek® CommercialWrap® will make fastener placement easier.



Step 3B

For masonry applications, temporarily attach to masonry, using adhesives with polyurethane, elastomeric or latex base in vertical strips spaced approximately 24" apart. For a list of suggested adhesives, call 1-800-44-TYVEK. Use cladding fasteners as permanent means of attachment.

Step 4

Unroll Tyvek® directly over window and door openings. The Tyvek® wrapped around the upper floors should overlap Tyvek® around the lower floors by approximately 6" and be fastened where overlapped. Tyvek® Contractor Tape should be used as a best practice to secure all horizontal and vertical seams.

Step 5

At the top plate, Tyvek® should cover the interface of the upper and lower plates.

Step 6

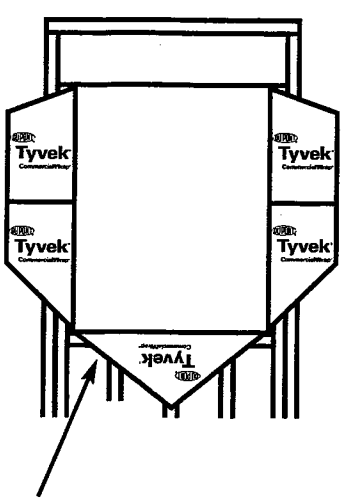
Around windows and doors, there are two installation methods:

BEFORE Windows and Doors Are Installed

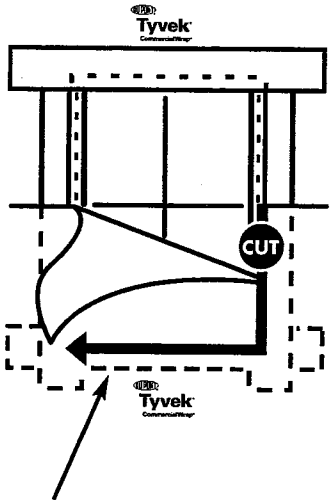
At each opening cut a modified "I" in the Tyvek® Pull sill and jamb flaps to the inside of the

NOTE: Although the gridlines printed on Tyvek® CommercialWrap® may aid in installation, they are not intended to replace the need for standard measurement or leveling techniques during installation and subsequent building construction.

Typical Window or Door Detailing

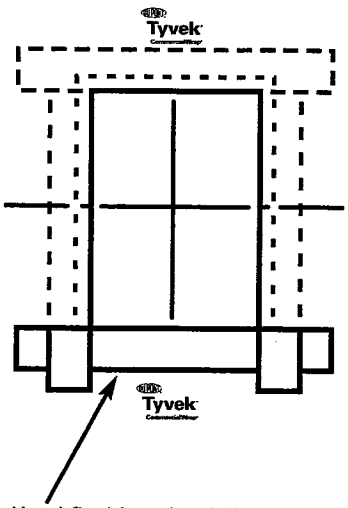


rough opening and fasten every 6". Trim off any excess. Cut two 45° angles in the Tyvek® from each top window corner. Temporarily tape Tyvek® flap up to ease window head flange installation. Install window or door and seal and flash in accordance with manufacturer recommendations. Install head flashing UNDER top flap of Tyvek®, and OVER the window or door flange. Extend flashing out OVER side flashing by 3"– 4." Unfold top flap of Tyvek® OVER head flashing and proceed to tape both 45° diagonal cuts. Lack of attention in this area can result in unwanted air and water intrusion.



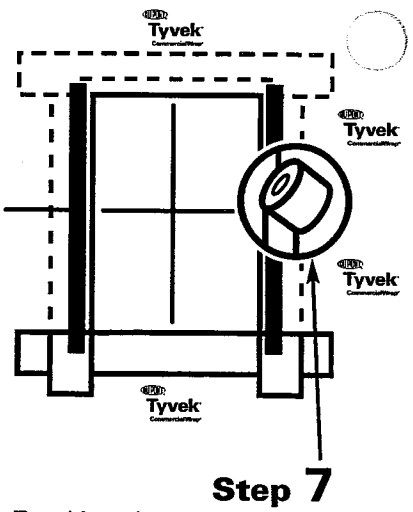
AFTER Windows and Doors Are Installed

Trim Tyvek® as close to the flange area as possible. All flashing should be installed according to manufacturer instructions. The sill flashing should have been installed prior to the window and attached along its top edge with the bottom edge free. Jamb (side) flashings can be installed before or after windows and should overlap sill flashing at the bottom.



Head flashing should be installed AFTER window or door and OVER the nailing flange. At the bottom of the window, trim Tyvek® around the window sill so you can pull sill and jamb flashing out together to overlap the Tyvek®. For maximum protection against leaks, tape the Tyvek® to the nailing flange at the sides of the windows using DuPont Contractor Tape.

In EIFS or other proprietary wall systems be certain to follow the EIFS manufacturers recommended installation for building wraps and flashing. Deviation from their installation requirements may void their warranty.



Step 7

To achieve the greatest energy savings potential and bulk water intrusion resistance with Tyvek® CommercialWrap®, all remaining horizontal and vertical seams or overlaps in the material and any and all tears or holes in the material should be patched with DuPont Contractor Tape. Taping Tyvek® to Tyvek® should be considered a best practice to minimize air and water infiltration behind the secondary weather barrier. Tyvek® is a secondary weather barrier, not a primary water barrier. The outer façade of the structure is the primary barrier. DuPont recommends that Tyvek® be covered within four months of installation.

Precautions

Tyvek® is slippery and should not be walked on in any application. Also, because it is slippery, DuPont recommends using kickjacks or scaffolding for exterior work above the first floor. If ladders must be used, extra caution must be taken to use them safely by following ANSI Standards A14.1, A14.2, and A14.5 for ladders made of wood, aluminum and fiberglass respectively.

Tyvek®, like all building papers, may be contaminated by building site chemicals (e.g. surfactants) potentially increasing its wetability. Such contamination could adversely affect water resistance of all building papers and thus the overall water resistance of the wall system.

For maximum protection against bulk water penetration, proper installation and interfacing of all wall system components is recommended. A good wall system (with properly flashed windows and doors) should combine a quality exterior façade, a good secondary weather resistive membrane and an exterior sheathing. In a system where no exterior sheathing is used and Tyvek® is installed directly over the studs, exterior façade materials should be selected to ensure maximum protection against water intrusion.

Tyvek® is combustible and should be protected from a flame and other high heat sources. If the temperature of Tyvek® reaches 750°F (400°C), it will burn and the fire may spread and fall away from the point of ignition. For more information, please call 1-800-44TYVEK.

Warranty

DuPont will replace any Tyvek® Weatherization System product damaged during installation by weather or normal handling if it is installed according to the procedures published by DuPont. If you have any questions, please call DuPont Tyvek® Weatherization Systems at **1-800-44TYVEK.**

DuPont™
DuPont Building Innovations

DUPONT
The miracles of science™

1-800-44-TYVEK
www.tyvek.com

DuPont™
Flashing Systems

INSTALLATION GUIDELINES

INSTALLATION GUIDELINES
for DuPont™ Flashing Systems™ with integral flanged windows **AFTER** weather-resistive barrier is installed.

DuPont™ FlexWrap™ and DuPont™ StraightFlash™ are highly engineered flashing tapes designed to be compatible with Tyvek® Weatherization Systems products. For optimal weather-resistive protection, we suggest you use Tyvek® HomeWrap®, Tyvek® StuccoWrap® or Tyvek® CommercialWrap®, DuPont™ Tyvek® Tape, and Tyvek® Wrap Caps.

GENERAL INSTRUCTIONS:

- DuPont™ FlexWrap™ and StraightFlash™ should be installed on clean, dry surfaces. Wipe surfaces to remove moisture, dirt, grease and other debris that could interfere with adhesion.
- Apply pressure along entire surface for a good bond.
- Remove all wrinkles and bubbles by smoothing surface and repositioning as necessary.
- DO NOT STRETCH DuPont™ FlexWrap™ WHEN INSTALLING.
- DuPont™ FlexWrap™ performs best when installed at temperatures above 40°F (4°C).
- For additional guidelines and suggested caulks, please call 1-800-44-TYVEK (800-448-9835).

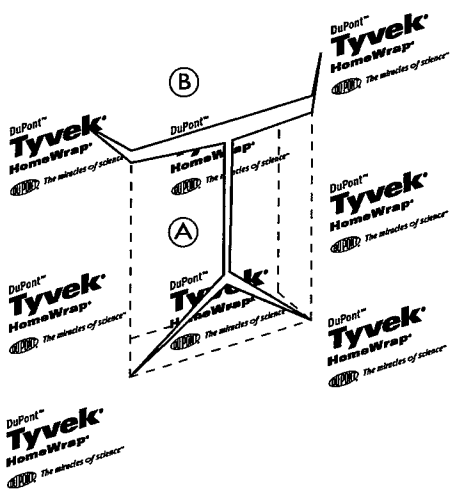
STEP 1

PREPARE WEATHER-RESISTIVE BARRIER FOR WINDOW OR DOOR INSTALLATION:

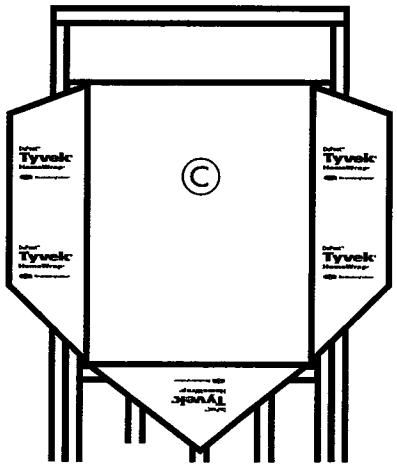
A. Make a modified "I-Cut" in the weather-resistive barrier. Begin with a horizontal cut across the top of the window frame. (For roundtop windows, the cut should begin 2" above the mull joint [see D]). From the center cut straight down about two-thirds of the way then angling the cut to each corner (see A).

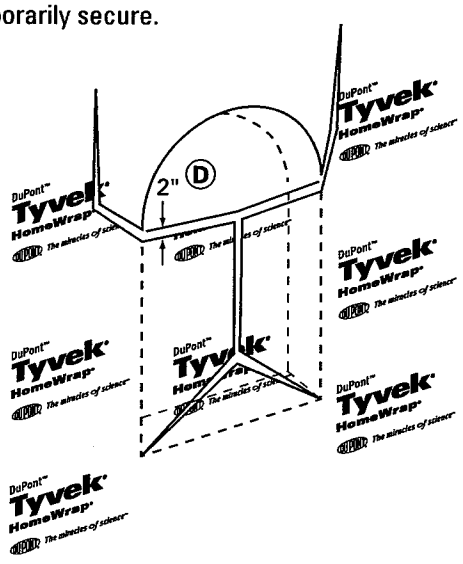
B. Cut a flap above the rough opening to expose sheathing or framing members and allow head flashing installation. Head flashing should adhere to exposed sheathing or framing members.

C. Fold side and bottom flaps into rough opening and secure. Flip head flap up and temporarily secure.



FOR RECTANGULAR WINDOWS





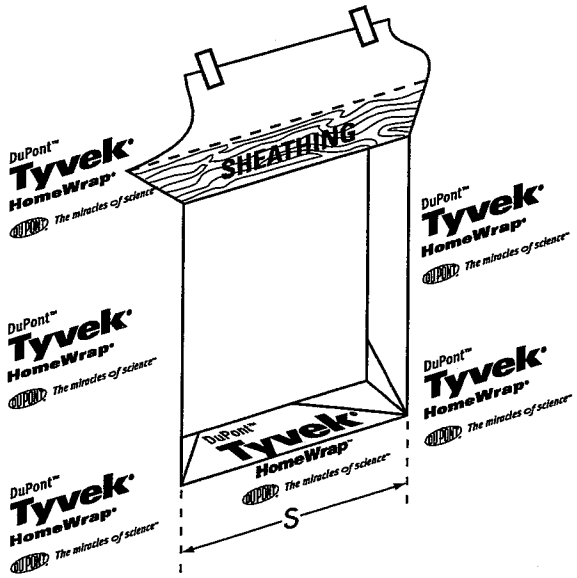
FOR ROUNDTOP WINDOWS

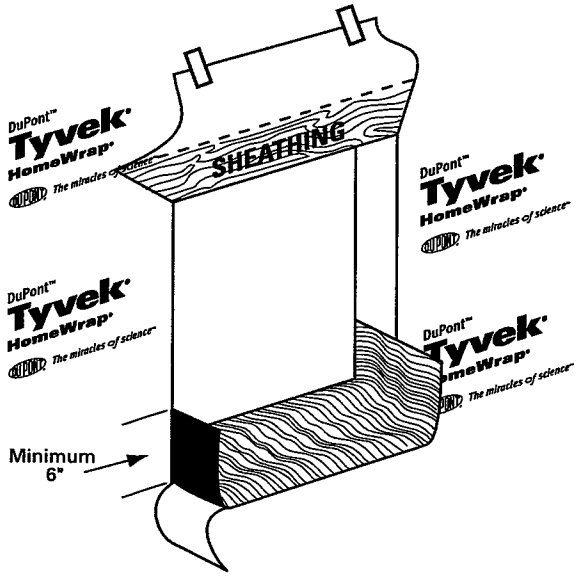
STEP 2

A. Cut DuPont™ FlexWrap™ at least 12" longer than width of rough opening sill (S).

B. Remove first piece of release paper, cover horizontal sill by aligning inside edge of sill, and adhere into rough opening across sill and up jambs (min. 6"). Cover horizontal sill by aligning FlexWrap™ edge with inside edge of sill.

C. Remove second release paper.



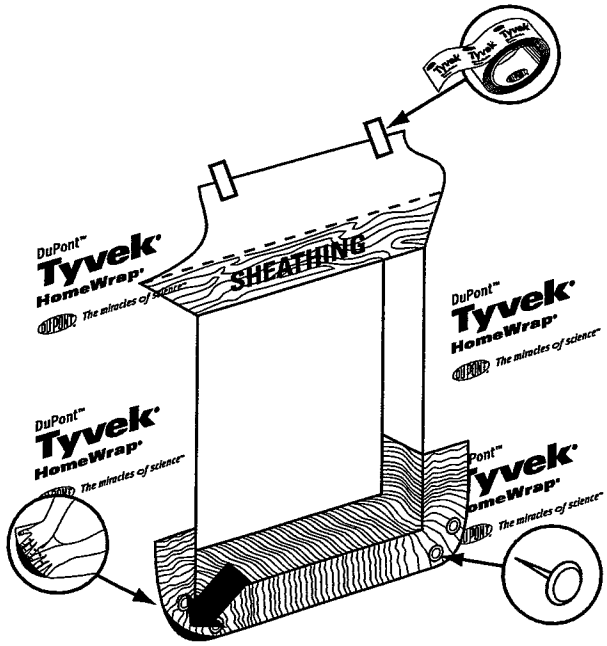


STEP 3

A. Fan DuPont™ FlexWrap™ at bottom corners onto face of wall.

B. Firmly press sill flashing to ensure full adhesion.

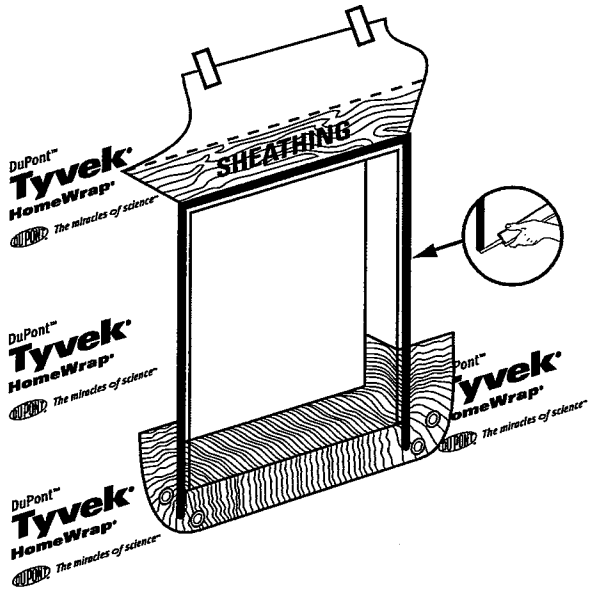
C. SECURE FANNED EDGES WITH MECHANICAL FASTENERS. (i.e. CapNails, staples, screws, etc.)



STEP 4

A. Apply continuous bead of caulk to wall or back side of window mounting flange across jambs and head, but leave bottom sill flange uncaulked.

B. DO NOT APPLY CAULK ACROSS BOTTOM SILL FLANGE.



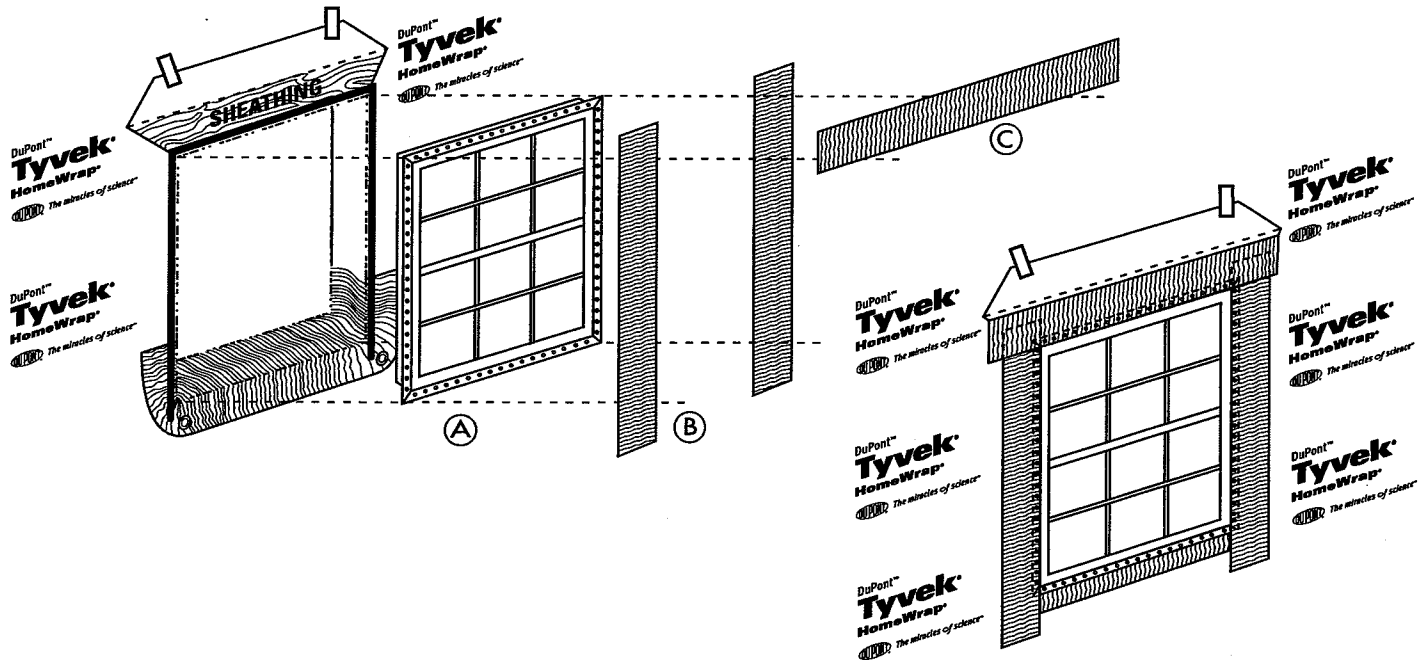
FOR RECTANGULAR WINDOWS:

STEP 5

A. Install window/door according to manufacturer's instructions. (illustration A)

B. Cut two pieces of DuPont™ StraightFlash™ or FlexWrap™ for jamb flashing extending 1" above window head flange and below bottom edge of sill flashing. Remove release paper and press tightly along sides of window frame. (illustration B).

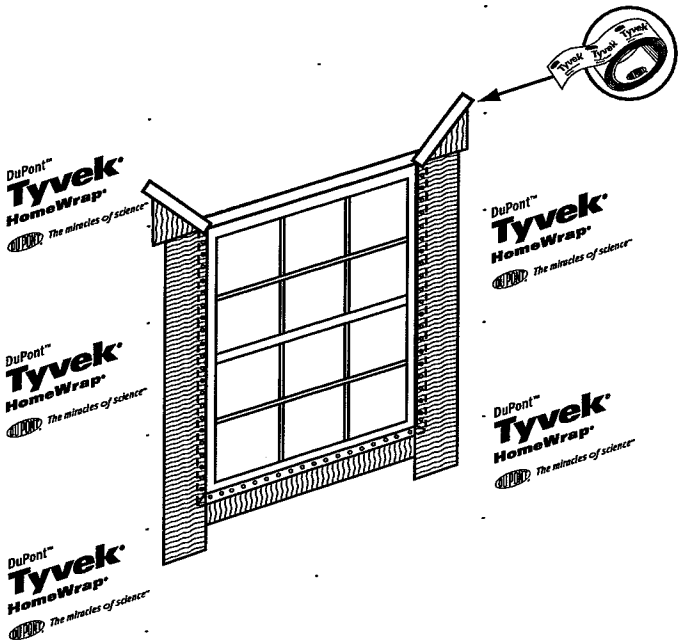
C. Cut a piece of DuPont™ StraightFlash™ or FlexWrap™ for head flashing, which extends beyond outer edges of jamb flashings. Remove release paper and install completely covering mounting flange and adhering to exposed sheathing or framing members. (illustration C)



STEP 6

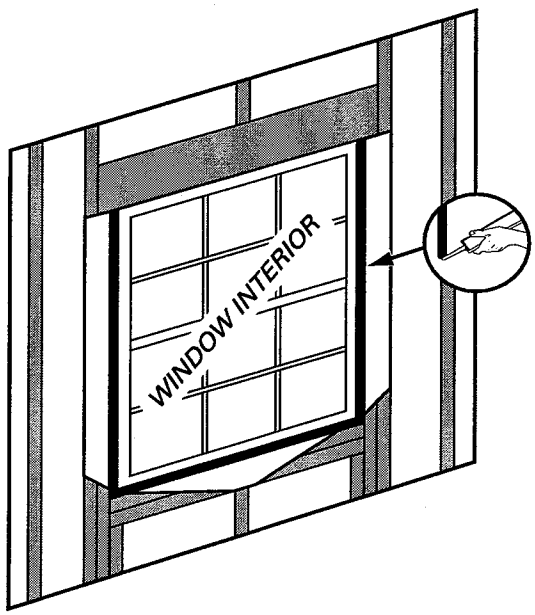
A. Flip down upper flap of weather-resistive barrier so it lays flat across head flashing.

B. Tape along all cuts in weather-resistive barrier and across head of the window with DuPont™ Tyvek® Tape.



STEP 7

Caulk (using backer rod if necessary) to seal rear of window/door frame to inside of rough opening across bottom and a minimum of 12" up the sides to form a back dam. To air seal around the window opening, caulk completely around the back edge of the window perimeter.

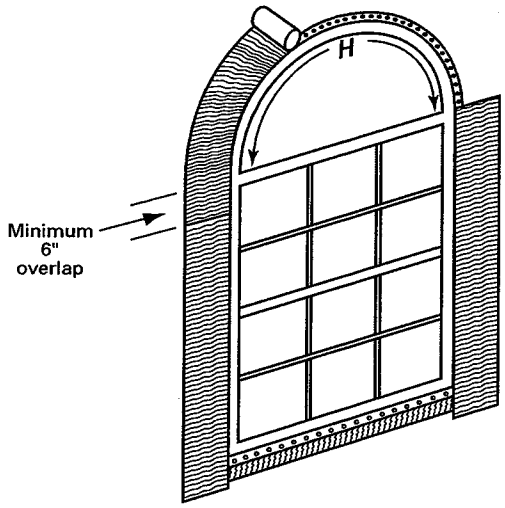


FOR ROUNDTOP WINDOWS:

STEP 8

A. Cut head flashing at least 12" longer than the arc length (H) of round-top window.

B. Remove both release papers and install to conform around top of window, covering entire mounting flange and adhering to exposed sheathing or framing members. Head flashing should overlap jamb flashings at least 6".

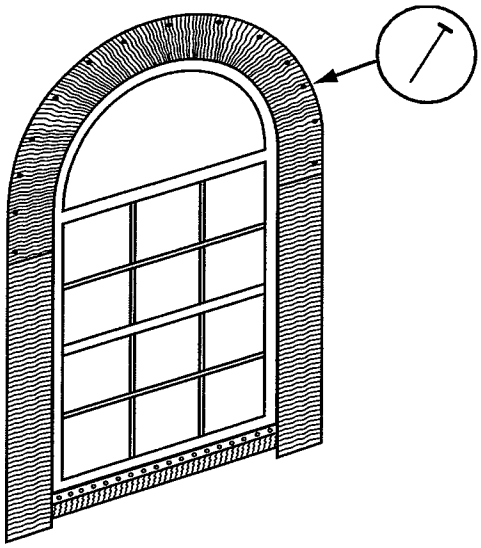


INSTALLATION TIP!

Remove short lengths of release papers, begin installation, then repeat until installation is complete.

STEP 9

Secure outer edges of head flashing using mechanical fasteners. (eg. CapNails, staples, screws etc.).

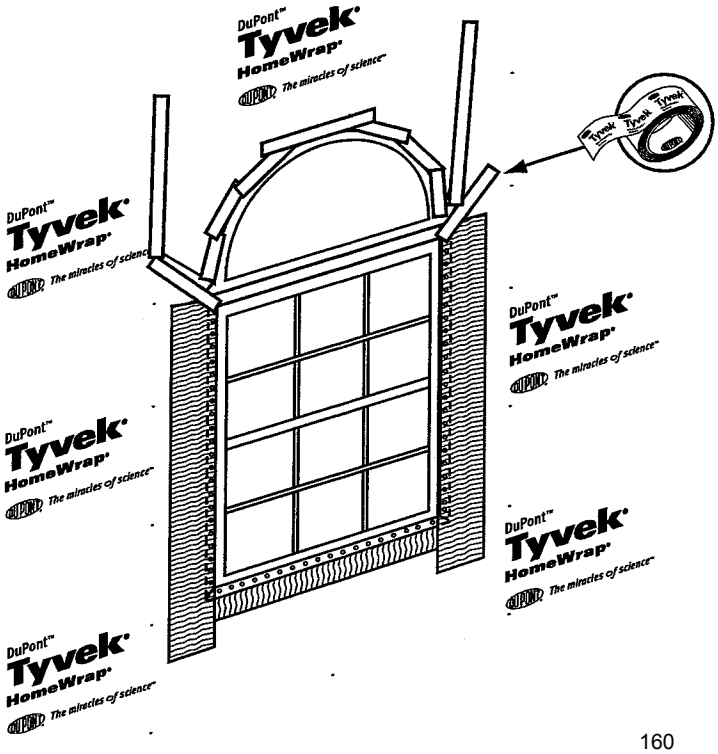


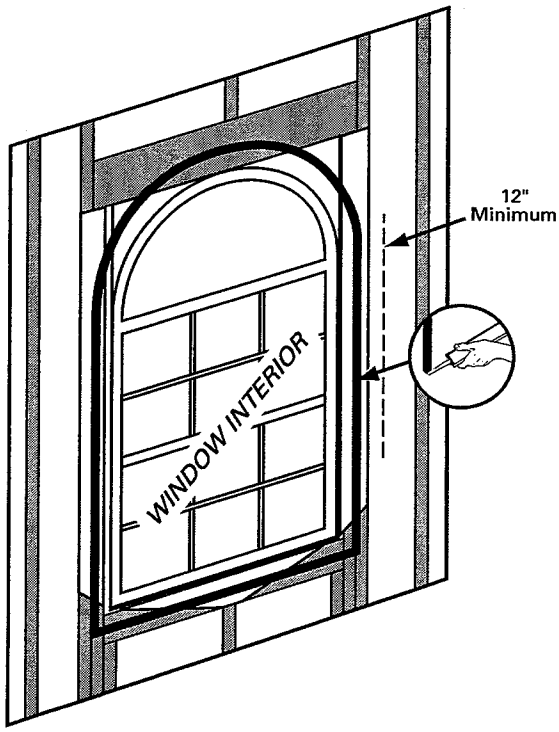
STEP 10

A. Flip down upper flap of weather-resistive barrier so it lays flat across head flashing.

B. Tape along all cuts in weather-resistive barrier and across head of the window with DuPont™ Tyvek® Tape.

C. Caulk (using backer rod if necessary) to seal rear of window/door frame to inside of rough opening across bottom and a minimum of 12" up the sides to form a back dam. To air seal around the window opening, caulk completely around the back edge of the window perimeter.





BUILDING CODE REPORTS

National Evaluation Report NER-642. Meets the ASTM E1677 Type 1 Air Retarder when installed according to Tyvek® Weatherization Systems best practices. See installation instructions on label.

TECHNICAL SPECIFICATIONS

Tyvek® used in construction products is made from 100% flash spunbonded high density polyethylene fibers which have been bonded together by heat and pressure, without binders or fillers, into a tough, durable sheet structure. Additives have been incorporated into the polyethylene to provide ultraviolet light resistance. DuPont suggests that Tyvek® be covered within four months (120 days) of installation.

DuPont™ FlexWrap™ and StraightFlash™ are made from a synthetic rubber adhesive and a laminate of polyethylene film, elastic fiber, synthetic rubber adhesive, polyurethane adhesive, and a top sheet of flash spunbonded high density polyethylene fibers. Additives have been incorporated into these materials to provide ultraviolet light resistance. DuPont suggests that DuPont™ FlexWrap™ and StraightFlash™ be covered within four months (120 days) of installation.

PRODUCT GUARANTEE

DuPont will replace any Tyvek® Weatherization System product damaged during installation by weather or normal handling if it is installed according to procedures published by DuPont. If you have any questions, call DuPont™ Tyvek® Weatherization Systems at 1-800-44-TYVEK.

If DuPont™ FlexWrap™ and StraightFlash™ product fails to meet published material specifications at the time of shipment, or contains defects created during its production, DuPont will replace defective material at no charge.

WARNING

Tyvek® is slippery and should not be used in any application where it will be walked on. In addition, because it is slippery, DuPont recommends using kickjacks or scaffolding for exterior work above the first floor. If ladders must be used, extra caution must be taken to use them safely by following the requirements set forth in ANSI Standards 14.1, 14.2 and 14.5 for ladders made of wood, aluminum, and fiberglass, respectively. Tyvek® is combustible and should be protected from a flame and other high heat sources. Tyvek® will melt at 275°F (135°C) and if the temperature of Tyvek® reaches 750°F (400°C), it will burn and the fire may spread and fall away from the point of ignition. For more information, call 1-800-44-TYVEK.

DuPont™ FlexWrap™ and StraightFlash™ and their release paper are slippery and should not be walked on. Remove release paper from work area immediately. DuPont™ FlexWrap™ and StraightFlash™ will melt at temperatures greater than 250°F (121°C). DuPont™ FlexWrap™ and StraightFlash™ are combustible and should be protected from flame and other high heat sources. DuPont™ FlexWrap™ and StraightFlash™ will not support combustion if the heat source is removed. However, if burning occurs, ignited droplets may fall away from the point of ignition. For more information, call 1-800-44-TYVEK.

NOTE

To Achieve greater potential energy savings and weather-resistance, any tears, breaks, holes, etc. created during normal construction should be repaired by taping or patching with Tyvek® weather resistive barriers. When installed in conjunction with other building materials, DuPont™ FlexWrap™ and StraightFlash™ should be properly shingled with these materials, such that water is diverted to the exterior of the wall system. Tyvek® products are weather resistive barriers not the primary water barrier (the outer facade is the primary barrier). Contamination of any Tyvek® weather-resistive barriers and building papers with building site chemicals which increase their wettability (e.g., surfactants) will adversely affect their water-resistance and therefore, their contribution to the overall water-resistance of the wall system. Tyvek® StuccoWrap®, DuPont™ FlexWrap™ and StraightFlash™ are suggested for use as outlined in this brochure. DuPont™ FlexWrap™ and StraightFlash™ are not suggested for use on roof windows. For superior protection against bulk water penetration DuPont suggests a system combining a quality exterior facade, a good secondary weather-resistive membrane and an exterior sheathing, appropriate flashing materials and details; and high quality windows and doors with particular attention to proper installation of each component. In a system where no exterior sheathing is used and Tyvek® is installed directly over the wall studs, exterior facade materials should be selected to ensure maximum protection against water intrusion. Careful workmanship and proper installation of each component is very important.

DuPont believes this information to be reliable and accurate. The information may be subject to revision as additional experience and knowledge is gained. It is the user's responsibility to determine the proper construction materials needed. Because conditions are outside of our control, DUPONT MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, AND ASSUMES NO LIABILITY WHATSOEVER AS TO THE PERFORMANCE OF THE PRODUCTS FOR A PARTICULAR USE. This information is not intended to be used by others for advertising, promotion or other publication for commercial purposes.

For more information:
1-800-44-TYVEK
www.Tyvek.com

DuPont™
Flashing Systems

DUPONT
The miracles of science™